The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 72, NO. 3 CHICAGO, ILLINOIS JANUARY 18, 1919

A BACTERIOLOGIC STUDY OF THE INFLUENZA EPIDEMIC AT CAMP DEVENS, MASS.

LESLEY H. SPOONER, M.D. (BOSTON)
Major, M. C., U. S. Army

JOSEPH M. SCOTT

AND

ELMER H. HEATH, JR.
Second Lieutenants, S. C., U. S. Army

CAMP DEVENS, AYER, MASS.

Camp Devens had been somewhat forewarned of the impending epidemic of influenza through rumors of its existence in the naval district about Boston, so that on September 7 the admission from one company of fourteen men with ill-defined fever aroused immediate suspicion. These patients were at once isolated, and an intensive study was started on them. Blood and urine cultures were consistently negative; those from the nasopharynx were also unsatisfactory, owing to the fact that the technic employed at that time was in some respects inadequate. None of these first patients had deep enough pulmonary involvement to yield satisfactory sputum, so that it was impossible to utilize that method of diagnosis.

A detailed account of the epidemic is not within the scope of this paper. It is quite sufficient to state that the disease spread like wildfire, and that in the course of four or five days the hospital was filled with cases of the disease.

This report will deal with bacteriologic findings alone. A pathologic study has been in progress in this laboratory from the start of the epidemic. Dr. S. Burt Wolbach, to whom we are indebted for many of the postmortem cultures cited in this paper, is at present engaged in an intensive study of a limited number of necropsies, which will be reported by him at a later date.

From the beginning of the epidemic, routine "sputum typing" was as usual carried out in cases suspected of pneumonia. Freshly prepared smears of sputum and the peritoneal exudate of inoculated mice showed such a frequent occurrence of a small, gram-negative bacillus, that this organism was at once considered as a very likely etiologic factor of the disease.

This investigation includes a study of cultures from the lungs, accessory sinuses and heart's blood at necropsy; and those derived from the sputum, nasopharyngeal secretions, pleural exudates, and blood of patients acutely sick with the disease.

TECHNIC

The medium employed was 2 per cent. agar, 0.2 per cent. of normal acid, enriched with hemoglobin. This was at first secured by pouring human blood over the surface of agar plates, but it was soon found more satisfactory to use 10 per cent. defibrinated blood agar plates. By this method the colonies were found to be much more distinct, and isolation was greatly facilitated. The latter was also favored by drying the surface of the medium by the introduction of filter paper into the cover of the dish, before sterilization.

MORPHOLOGY

The gross morphology of the cultures and the microscopic appearance of the organism correspond exactly with that of the bacillus of influenza of Pfeiffer. The colonies are minute, spherical, elevated, colorless, translucent, discrete and moist. They appear along the line of inoculation, spreading only a short distance from it, and always remaining as discrete colonies. At the end of twenty-four hours they are scarcely visible and are often confused with the material that has been streaked on the surface of the medium. At the end of forty-eight hours the growth is generally well marked and is as described above. The organism is an obligate aerobe and on blood on agar plates appears only at the edge of the superimposed blood. This is another reason for adopting the blood agar plate described above.

Frequent transplantation is necessary in order to insure the viability of the culture. On an average, tubes left for one week at room temperature have been found sterile. Of thirty-eight cultures shipped by mail from this laboratory to the Army Medical School in Washington, only two failed to grow on reinoculation.

Artificial enrichment of mediums by the growth of *Staphylococcus aureus* was attempted according to Besson. The addition to the mediums of dead cultures of such organisms not only did not promote growth of *B. influenzae*, but apparently caused a retardation. When, however, *Staphylococcus aureus* was streaked across a plate already impregnated with *B. influenzae*, the latter showed a marked increase in growth in the immediate vicinity of *S. aureus* streaks, large colonies being evident in from eighteen to twenty hours.

Similar results were obtained by the symbiotic action of *B. subtilis*, effected by connecting the two culture tubes, separately impregnated, by a short rubber tubing.

Microscopic Morphology. — The organism is a minute, gram-negative bacillus, varying in length from coccoid to filamentous forms. The older cultures show a marked pleomorphism. The organism decolorizes with gram stain. Polarity is evident especially with methylene blue and dilute carbolfuchsin.

PATHOGENICITY

More than a hundred intraperitoneal injections of mice have shown that the organism is not pathogenic to that animal.

Two sets of experiments have failed to reveal evidence of pathogenicity of this organism to guinea-pigs, either from intraperitoneal or from intravenous injection. For all injections the following technic was employed: *B. influenzae* was grown on blood agar slants in 75 by 10 mm. tubes for forty-eight hours. To each slant was added 1 c.c. of sterile saline solution and a uniform mechanical suspension obtained.

The rabbit was considered as the best animal for the production of antiserums, and for this purpose three methods were employed, all being controlled by two animals, and by parallel animals not inoculated. One set of animals received intraperitoneal injections, one intravenous, and the last intratracheal insufflations. All animals were isolated, except as noted, and carefully watched. Temperatures were taken twice daily. In every instance there was an initial rise of temperature much more prompt in its appearance in the intravenous and insufflation experiments than in the intraperitoneal. This temperature, which ranged between 104 and 106 F., persisted for from twelve to thirty-six hours, generally falling to normal gradually. (The normal has been considered to be between 101.5 and 103.5 F.)

Necropsy has failed to show evidence that any disease process, similar to that produced by B. *influenzae*, resulted from these experiments.

Only two of the animals have been sick. Rabbit 7—or Insufflation 1—developed a coryza twelve hours after the introduction into the trachea by direct operation of 0.5 c.c. of suspension of pure culture of *B. influenzae*. The purulent secretion from the nose showed a pure growth of *B. influenzae*.

A healthy rabbit was placed in the same cage with this infected animal for four days, but has remained healthy up to the present time.

Rabbit 7 was etherized, bled, and killed five days after insufflation. The trachea showed extensive injection of the mucous membrane, which was covered as far as the bifurcation with dirty mucosanguineous secretion. Smears and cultures from this area were negative. The lungs showed no evidence of pathologic involvement. The parallel insufflation experiment on Rabbit 8 was negative except for the immediate reaction, described above, following two insufflations, the latter of 2 c.c. of suspended culture. Rabbit 5, two days following the third intraperitoneal injection (of 1.5 c.c. culture), developed a temperature of from 106 to 106.2 F. and rapid and labored breathing. These symptoms persisted for two days. At that time the animal was etherized and bled for serologic purposes. This rabbit died three days following this operation. Necropsy revealed no gross pathologic condition except an extensive hemopericardium, the result of repeated heart punctures. The tissues are now being prepared for microscopic examination; but it seems very remote to expect any pathologic change as a result of inoculation. From these experiments it is evident that no typical pathologic lesions have been produced in the rabbit by injections of *B. influenzae*.

BACTERIOLOGIC FINDINGS

In the work about to be described, the presence of *B. influenzae* in the smear alone has always been thought inconclusive. It has always been considered necessary to isolate the organism in pure culture to warrant a report of positive findings. The influenza bacillus has been isolated from the sputum in 104 cases. It was first recovered from blood agar subcultures of the peritoneal exudate and heart's blood of mice inoculated with sputum according to the method advised by Blake[1] for the typing of pneumococci. It was found, however, that it was not necessary to resort to this device to secure a culture, unless it was desired to ascertain the presence of a mixed pneumococcus infection, for the careful inoculation of a blood agar plate with washed fresh sputum yielded positive results in a surprising number of attempts.

It was felt from the very beginning of this work that, although *B. influenzae* was so frequently present in this epidemic, mixed infection played a very important rôle in the progress of the complicating pneumonias. For this reason the routine sputum typing was continued and the results are of considerable interest (Table 1). Too much weight should not, of course,

TABLE 1.—OCCURRENCE OF INFLUENZA BACILLI IN ASSOCIATION WITH PNEUMOCOCCI AND OTHER ORGANISMS IN SPUTUM

	No. of Times
With Pneumococcus Type I	5
With Pneumococcus Type II	2
With Pneumococcus Type II (subgroup)	1
With Pneumococcus Type III	5
With Pneumococcus Type IV	52
Pneumococci, rare or absent	25
With Streptococcus hemolyticus	2
Total	92
B. influenzae cultivated directly	12
Total B. influenzae cultures from sputum	104

be placed on the occurrence of a mixed infection with Type IV pneumococcus; that with Types I, II and III and with *Streptococcus hemolyticus* is of great interest. The therapeutic importance of such an infection has been considered in a previous report by one of us (L. H. S.[2]).

Nasopharyngeal swabs were made in a few fresh cases shortly after the epidemic had reached its height. They were positive in seven out of ten trials. In the later stages they were positive in four out of eight cases—a total of eleven positive cultures.[3]

PLEURAL FLUID CULTURES

Similar results have been found on cultivating pleural fluids in cases of empyema complicating the pneumonias of this epidemic. They are presented in Table 2, from which it will be seen that eight times the influenza bacillus has been isolated from chest fluids: twice alone and six times in conjunction with other organisms.

TABLE 2.—OCCURRENCE OF ORGANISMS IN PLEURAL FLUID CULTURES

	No. of Times
Pneumococcus Type I	11
Pneumococcus Type II (subgroup)	5
Pneumococcus Type III	2
Pneumococcus Type IV	7
	25
Streptococcus hemolyticus	3
B. influenzae (pure)	2
B. influenzae and Streptococcus hemolyticus	2
B. influenzae and pneumococcus	4
No growth (serous)	8

1. Blake, F. G.: J. Exper. Med. **26**: 67, 1917.
2. Spooner, L. H.; Sellards, A. W., and Wyman, J. H.: Serum Treatment of Type I Pneumonia Occurring in Association with an Epidemic of Influenza, J. A. M. A. **71**: 1310 (Oct. 19) 1918.
3. For this technic and for suggestions in cultural methods we are indebted to Capt. Oswald T. Avery, M. C., U. S. Army.

BLOOD CULTURES

The blood of pneumonia patients has been cultivated during the past month as systematically as possible; 118 cultures were taken, with twenty-eight, or 24 per cent., positive cultures, and ninety, or 76 per cent., negative cultures. The pneumococcus was found in twenty-seven, and *Streptococcus hemolyticus* in one. The character of the organisms isolated is presented in Table 3, which covers the height of the epidemic and from which it will be seen that in no instance could *B. influenzae* be recovered from the blood, but that a slightly higher percentage of positive pneumococcus cultures was obtained than was found previously in this laboratory.

TABLE 3.—OCCURRENCE OF ORGANISMS IN BLOOD CULTURES

	No. of Times
Pneumococcus Type I	10
Pneumococcus Type II	7
Pneumococcus Type III	1
Pneumococcus Type IV	9
Streptococcus hemolyticus	1
Total	28

POSTMORTEM CULTURES

During the early days of the epidemic it was often impossible to devote as much attention to a careful study of the bacteriology of necropsies as would have been desired under other circumstances. Many of the necropsies were performed so many hours postmortem that such cultures were not taken, because it was felt that they would have been worthless. Also during the busier times it was impossible to type the pneumococci isolated from the blood and other sources.

TABLE 4.—OCCURRENCE OF ORGANISMS IN CULTURES OF HEART'S BLOOD AND LUNGS

Necropsy	Heart's Blood	Lungs
162	Pneumococcus	Pneumococcus, B. influenzae
164	No growth	Pneumococcus
165	Pneumococcus, Streptococcus hemolyticus	Pneumococcus
166	No growth	Pneumococcus
174	Pneumococcus I	B. influenzae
176	Pneumococcus I	B. influenzae
180	Pneumococcus	B. influenzae
183	Pneumococcus II	B. influenzae
187	No growth	Streptococcus hemolyticus
190	No growth	No growth
191	B. influenzae	No growth
192	Pneumococcus IV	B. influenzae
193	No growth	No growth
194	Streptococcus hemolyticus	Streptococcus hemolyticus, B. influenzae
195	Pneumococcus IV	B. influenzae
197	Pneumococcus II	Pneumococcus II, B. influenzae
198	No culture	B. influenzae
199	No growth	Pneumococcus
201	Streptococcus hemolyticus	No growth
202	Pneumococcus IV	B. influenzae
203	Pneumococcus IV	Streptococcus hemolyticus, B. influenzae
204	Pneumococcus IV	No growth
207	Pneumococcus II	Pneumococcus II
211	Pneumococcus IV	Pneumococcus IV, B. influenzae
213	Pneumococcus II	B. influenzae
214	Pneumococcus I	B. influenzae, Pneumococcus
215	Pneumococcus I	No growth
216	No growth	No growth
218	Pneumococcus IV	B. influenzae
220	Pneumococcus IV	Streptococcus hemolyticus, B. influenzae
222	Streptococcus hemolyticus	Pneumococcus
224	No growth	B. influenzae
229	Pneumococcus IV	B. influenzae, Staphylococcus aureus
230	Pneumococcus III	B. influenzae, Streptococcus hemolyticus
231	No growth	B. influenzae
232	No growth	B. influenzae
234	Pneumococcus II	B. influenzae, Pneumococcus II, Streptococcus viridans

For this reason it is possible to report only thirty-seven cases which have been studied thoroughly enough to warrant their admission as reliable evidence. In all cases the organisms have been recovered in pure culture and their identity proved by cultural characteristics and microscopic morphology and staining reaction.

Table 4 shows the result of heart's blood and lung cultures; the former taken by a pipet into nutrient broth, the latter from the seared lung on the surface of blood agar plates.

The great significance of *B. influenzae* as an etiologic factor of the pneumonia in this epidemic may not be clearly brought out by Table 4, which shows the preponderance of organisms found in all lobes of the lungs at each necropsy. It is very significant, however, that *B. influenzae* was found in pure culture in at least one lobe in sixteen of thirty-seven necropsies. The necessity of early necropsy is shown by the fact that successful attempts to isolate the organism resulted twenty times when examination was made less than five hours postmortem, and in only three when a greater time had elapsed.

It will be seen that *B. influenzae* has been recovered from the lung in twenty-three necropsies. The occurrence is given in Table 5.

TABLE 5.—OCCURRENCE OF ORGANISMS IN THE LUNG

	No. of Times
B. influenzae (predominant)	14
B. influenzae and pneumococcus	4
B. influenzae and Streptococcus hemolyticus	3
B. influenzae and Staphylococcus aureus	1
B. influenzae, streptococcus viridans and pneumococcus	1
Streptococcus hemolyticus	1
Pneumococcus	6
Negative	7
Total	37

B. influenzae occurred alone or with other organisms in twenty-three, or 62 per cent., of thirty-seven cases.

In addition, *B. influenzae* has been recovered from the frontal sinus in four cases; from the sphenoidal sinus in eight, and from the middle ears in two. These occurred in the manner shown in Table 6.

TABLE 6.—OCCURRENCE OF ORGANISMS IN FRONTAL SINUS, SPHENOIDAL SINUS AND MIDDLE EARS

	Frontal Sinus	Sphenoidal Sinus	Middle Ears
B. influenzae	2	2	..
Pneumococcus	..	1	..
B. influenzae and pneumococcus	2	3	1
B. influenzae, pneumococcus and Micrococcus catarrhalis	..	1	1
B. influenzae and Streptococcus hemolyticus	..	1	..
B. influenzae, Streptococcus hemolyticus and pneumococcus	..	1	..

Although the lung cultures were carefully studied in only thirty-seven necropsies, blood cultures were made in eighty during the epidemic, the results of which are given in Table 7.

TABLE 7.—OCCURRENCE OF ORGANISMS IN BLOOD CULTURES

	No.	Per Cent.
Total cultures reported	82	....
Pneumococcus (type undetermined)	20	....
Pneumococcus Type I	7	....
Pneumococcus Type II	13	....
Pneumococcus Type III	2	....
Pneumococcus Type IV	10	....
Total pneumococci	52	65.0
Streptococcus hemolyticus	6	7.5
B. influenzae	2	2.5
Staphylococcus	1	....
Contaminated	1	....
No growth	20	25.0

(Two cultures showed two organisms.)

It is well recognized that *B. influenzae* is difficult to isolate from the heart's blood; but the high percentage (65 per cent.) of pneumococci found at this time shows the importance of mixed infection.

It is the object of these figures to show that, although *B. influenzae* is present in frequency enough to warrant the statement that it was the most important etiologic factor of this epidemic, yet considerable importance must be placed on the secondary invaders, the pneumococcus and in this hospital rarely the *Streptococcus hemolyticus*, which are found in such a large percentage of cases examined, both during life and postmortem.

SEROLOGIC INVESTIGATION

Macroscopic agglutinations have been performed on various individuals, at first with homogeneous serum and later with heterologous serum. The technic employed was as follows: A uniform moderately turbid suspension of *B. influenzae* was obtained from washing the surfaces of forty-eight hour blood agar slant cultures. Dilutions were made ranging from 1:2 to 1:800 in agglutinating tubes, which were incubated in the water bath at 37 C. for from twelve to eighteen hours. It was found that readings were facilitated by placing the tubes after incubation in the ice box for from four to six hours. Saline controls were run at the same time. A distinct but fine flocculent precipitate was read as +; heavier and coarser precipitate as ++, and large masses of agglutinated organisms as +++. Tables 8 and 9 are illustrative of the fact that the formation of agglutinins takes place gradually after the disease and that there is no strong evidence to favor a variety of strains of *B. influenzae*, since no difference in titer of the most potent serums was found with either homogeneous or heterologous cultures. It is interesting to note the frequency of negative readings in low dilutions in serums that show a high titer. A series of controls, taken from members of the staff of this laboratory, showed no natural agglutinin for this organism.

Even more striking results are shown in the agglutinin reactions in rabbits at varying stages of their "immunization" with living cultures. In the later titrations the lower dilutions have been omitted.

Very unsatisfactory results have come from a few efforts to demonstrate specific precipitins and bacteriolytic substances, although the results are encouraging enough to warrant further study.

TABLE 8.—HUMAN AGGLUTINATION REACTIONS

Con-trol	1:2	1:5	1:10	1:20	1:50	1:100	1:200	1:400	1:800
Group I—One Week after Onset									
1 —	—	—	++	+++	—	—	—	—	—*
2 —	—	—	—	—	—	—	—	—	—*
3 —	—	—	—	—	+++	—	—	—	—*
4 —	—	++	++	+++	+	+	+	—	—*
5 —	—	+	++	+++	++	+	—	—	—*
Group II—Four Weeks after Onset									
6 —	+++	+++	++	++	+	—	—	—	—†
7 —	++	++	++	++	+	—	—	—	—†
8 —	++	++	++	++	+	+	+	—	—†
9 —	++	++	+	+	—	—	—	—	—†
10 —	—	—	—	—	—	—	—	—	—†
11 —	+++	++	++	++	++	+	—	—	—†
12 —	—	—	—	—	—	—	—	—	—†
Group III—Five Weeks after Onset									
13 —	+++	+++	+++	+++	++	+	+++	++	++*
14 —	++	++	+++	+++	++	—	—	—	—*
15 —	—	+	++	++	+++	++	+++	+++	+++†
16 —	—	—	++	+++	+++	+	+++	+++	+++†
17 —	—	—	+	+++	+++	++	+	+++	++†
18 —	—	+++	+++	+++	+++	++			—†
19 —	+	+++	+++	+++	+++	++	++	+++	+++†
20 —	++	++	+++	+++	—	—	+++	+++	+++†
Group IV—Healthy Controls									
21 —	—	—	—	++	—	—	—	—	—†
22 —	—	—	—	—	—	—	—	—	—†
23 —	—	—	—	—	—	—	—	—	—†
24 —	—	—	—	—	—	—	—	—	—†
25 —	—	—	—	—	—	—	—	—	—†
26 —	—	—	—	—	—	—	—	—	—†
27 —	—	—	—	—	—	—	—	—	—†

* Homogeneous culture † Heterologous culture.

COMMENTARY

It is perfectly obvious that it is impossible to prove the etiologic factor of a disease when, with the best available technic, the organism in question is not, strictly speaking, "constantly present" in the lesions, and when it is impossible to reproduce the disease in lower animals by inoculation.

It seems reasonable to suppose that the prime factor in this epidemic was *B. influenzae*, since it was found in such a large proportion of specimens of sputum when the latter was derived from the lower air passages and was properly examined; since the organism was recovered from lungs postmortem in 62 per cent. of those cases carefully studied, and in pure culture from at least one lobe in 50 per cent. of the same series; and since the blood of patients convalescent from the disease showed a rising agglutinating power not only to their own organism, but also to heterologous cultures.

The following points must be borne in mind in any study of this organism: The demonstration of organisms morphologically similar to *B. influenzae* in smears is insufficient for diagnosis, but such organisms must be cultivated in pure culture on hemoglobin mediums, and subsequent transplants on hemoglobin-free mediums must show no growth.

Although the organism grows better in symbiosis with other organisms, especially the staphylococcus, there is great danger of overgrowth.

Care should be taken not to discard cultures as negative, since in many instances appreciable growth does not appear until after from forty-eight to seventy-two hours' incubation.

TABLE 9.—RABBIT AGGLUTINATION REACTION

	Control	1:2	1:5	1:10	1:20	1:50	1:100	1:200	1:400	1:800	1:1,600	1:3,200	1:6,400	1:13,000	Nature of Culture
Rabbit 5: Intraperitoneal Injection															
10/23/18, 6 days following 1st injection	—	+++	+++	+++	+	++	+	++	++	+	.....	.....	.....	.....	Homogeneous
	—	+++	+++	+++	+++	+++	++	++	+	+	.....	.....	.....	.....	Heterologous
10/29/18, 6 days following 2d injection	—	.....	.....	—	—	—	+	++	++	+	++	++	.....	.....	Homogeneous
11/2/18, 4 days following 3d injection	—	.....	.....	++	.....	.....	+++	+++	+++	+++	+++	+++	+++	+++	Heterologous
Rabbit 6: Intravenous Injection															
10/23/18, 6 days following 1st injection	—	+++	+++	+++	++	++	++	—	—	—	.....	.....	.....	.....	Homogeneous
	—	+++	+++	+++	++	++	+	—	—	—	.....	.....	.....	.....	Heterologous
10/29/18, 4 days following 2d injection	—	.....	.....	++	++	++	+++	+++	++	++	++	+++	.....	.....	Homogeneous
11/2/18, 8 days following 2d injection	—	.....	.....	+++	.....	.....	+++	+++	+++	+++	+++	—	.....	.....	Heterologous
Rabbit 4: Control															
10/23/18	—	—	—	—	—	—	—	—	—	—					
Rabbit 11: Control															
10/23/18	—	—	—	—	—	—	—	—	—	—					

V. 19

The direct smear method is of value in indicating what may be expected in culture. The most striking fact in regard to such preparations lies in the great frequency of intracellular *B. influenzae*.

Too great stress cannot be laid on the absolute necessity of immediate necropsies if one is anxious to recover this organism, before overgrowth renders such results impossible.

CONCLUSIONS

1. *B. influenzae* has been isolated from pneumonia sputum, pleural fluids, and the nasopharynx during life, and from the heart's blood, lungs, and accessory sinuses postmortem in a high percentage of cases of this disease, very frequently in pure culture.

2. Specific agglutinins have been found in the serum of convalescents which produce satisfactory reactions, especially during the weeks following infection, on homogeneous and heterologous cultures.

3. A high titer serum has been produced in rabbits by repeated inoculations with living cultures. This serum has shown an increase of potency with the passage of time. Such serum should be of value as a means of differentiating allied organisms.

EDEMA OF THE BRAIN IN THE INFECTIOUS DISEASES

C. T. SHARPE, M.D.
NEW YORK

Little is to be found in the literature relative to edema of the brain in the infectious diseases as a clinical entity, and much less, therefore, if anything, as to edema as a clinical type of an infectious disease. We are all familiar with the occurrence of meningismus in acute diseases, and during the febrile stage are not surprised to have some evidence of it; but how many of us are prepared to take the position that edema does, in some cases, develop to such an extent that it masks the ordinary clinical picture of the disease and may occasion doubt as to the diagnosis?

Edema of the brain may and does appear at different periods in the course of the infectious diseases. When it occurs early it may hide the true nature of the illness and it has been noticed on several occasions that with the predominance of this feature there may be an atypical rash and the picture so unusual that grave doubt arises as to the basic diseases. When it appears late the difficulty is increased greatly, because if we are unaware that such is to be expected and looked for we may be somewhat disconcerted and wander from Dan to Beersheba, seeking the correct diagnosis, and return empty handed.

The recent epidemic of poliomyelitis offered unusual advantages for the clinical study of edema of the brain. The mental attitude of the patients is one of the most striking features, and all variations from hyperexcitability to melancholia, from gibberish to silence, associated with and without paralysis, but always with edema, were noted. In our study of these cases we soon appreciated the difficulty of reaching any agreement as to the interpretation of the Macewen sign on the basis of sound and we adopted a modification of the sign, as described, and based our findings on the difference in resistance noted on percussion. Increased resistance on percussion was used as a guide to treatment and was the determining factor in the performance of lumbar puncture. It was interesting to observe how readily visitors to our wards took up this method and how regularly an agreement as to findings was reached.

It will, no doubt, be admitted readily that a clinical diagnosis of edema of the brain may be correctly made from a study of objective symptoms alone, and more readily admitted that in poliomyelitis it is one of the most frequent symptoms. It will not be so readily admitted that in the infectious diseases the same condition is to be found; nevertheless, it is possible to establish by the same signs and symptoms the same clinical facts and to confirm these in various ways. As in poliomyelitis, so in scarlet fever, measles and diphtheria the edema of the brain exists; as in poliomyelitis, so in the diseases mentioned the amount of the edema changes the clinical picture from the generally accepted type to one that may lack characteristic symptoms. In scarlet fever the rash may be atypical and the mental condition marked, and grave doubt may arise unless we recognize the variation in type. As in poliomyelitis, so in the diseases mentioned this edema may persist for weeks after convalescence is established.

TIME OF OCCURRENCE

From the very beginning, the mental symptoms may predominate; or they may not develop for from twenty-four to forty-eight hours or longer after the onset. They may not develop until the third week, and again, they may not be sufficiently evident until after convalescence is well established—after the fourth week in scarlet fever and after the second week in measles—to give rise to any serious thought. In hospital practice it is not unusual to have a child sent in who has been ill for from six to eight days, who shows no evidence of scarlet fever or other infectious disease, who is delirious and who may prove very hard to control. Here the history may help and the case is isolated; but if a patient is admitted and there is no such history to guide one, a grave injustice may be done other patients. It is well, therefore, to consider the possibility of the infectious diseases if such a case presents itself in private or hospital practice.

ANALOGY TO SYPHILIS

It would seem that there is some analogy between syphilis and the infectious diseases. It is well known that a syphilitic patient presenting marked cutaneous symptoms may be absolutely free from any involvement of the nervous system, and may never develop a nerve lesion. Again, patients present themselves showing all grades of involvement of the nervous system who cannot recall ever having had an eruption of the skin. One may hesitate to believe that these patients never showed any skin manifestations, but one must admit that the rash must have been very insignificant to have escaped recognition or, in other words, that the rash was atypical.

INTERRELATIONSHIP BETWEEN CUTANEOUS AND SPINAL PRESSURE

In presenting the history of an interesting case of cerebrospinal meningitis to the Pediatric Section of the New York Academy of Medicine a year ago, I made this observation:

It would seem that when the spinal symptoms are marked, the cutaneous symptoms may be negative and vice versa. That this interrelationship holds I have long been convinced.

In the infectious diseases, both during the early and the late periods of the illness, I have noted repeatedly marked cerebral symptoms, as evidenced by stupor, low muttering delirium and slight retraction, possibly edema of the brain, relieved by a profuse cutaneous eruption.

From observations made in the past eleven years, some of which will be recorded here, it would seem certain that we may have the cerebral manifestations masking the cutaneous evidence of the disease to such an extent that the cerebral type of the infectious diseases must be recognized as an entity. The occurrence of influenzal meningitis and of pneumonic meningitis are too well known to be more than mentioned. Here again the analogy between these diseases and the exanthematous infectious diseases should be borne in mind. Tuberculous meningitis is still another analogous condition. In fact, so many instances of the selective action of the bacteria or of the toxins of the infectious and contagious diseases may be cited to prove the possibility of an involvement of the cerebrospinal axis and the nervous system generally, as opposed to the viscera and the skin, that we must accept as an axiomatic statement that in the infectious and contagious diseases, the central nervous system may be involved by the bacteria or their toxins to such an extent that this involvement may far outweigh and mask the involvement of the viscera and the skin. It may be that we are justified to go farther and state that the primary involvement may be that of the central nervous system and that when such primary involvement does occur the other manifestations may be wanting or so atypical as to be deceptive. In scarlet fever, measles and diphtheria, edema of the brain exists in some cases to a very marked degree, as I have noted in clinical and postmortem observations, and I am quite willing to believe that it also exists in chickenpox and smallpox from clinical observations I have made and the pathologic findings of others.

CLINICAL SYMPTOMS

In the early stages the evidence of edema is to be found in the stupor, retraction of the head, the cephalic cry, the upward retraction of the eyes, muscular twitchings, tache cérébrale, delirium out of all proportion to the temperature, a marked Macewen sign, the presence of increased reflexes, and in some the loss of reflexes, in some rare cases of paralysis, positive Kernig, Brudzinski, Babinski and Oppenheim signs. The correctness of the diagnosis is proved by lumbar puncture with release of spinal fluid under increased pressure and by the analysis of the fluid.

In the later stages the evidence is to be found in the melancholia bordering on manic-depressive manifestations and phobias in some cases, while in others there is hyperexcitability and a more or less constant talking and at times the unusual use of obscene language. Any of these conditions, associated with a marked Macewen sign and an increase of reflexes with other signs noted under the early stage, and the spinal fluid findings establish the diagnosis. Further, the fact that the condition clears up with spinal puncture and other appropriate treatment removes the probability that the condition is due to another underlying condition, especially when these patients subsequently regain and retain normal mentality and health.

Nor is this all; for it is possible to see the edema and surely "seeing is believing." Varying degrees of retinitis, congestion and blurring of the disk have been noted in these patients. That you might not be asked to accept these clinical facts on my observations alone, several well qualified physicians have been asked to examine patients in our wards at the present time and they have confirmed the statements made as to the ophthalmoscopic findings not only in acute cases but in those about to be discharged.

Recently a boy, aged 7½ years, wrote a post-card to his mother, and this post-card prompted an examination of the writer, although he was about ready to go home; he had a positive Macewen sign and an evident edema on ophthalmic examination. He had been acting rather queerly, and it may be that the condition found had nothing to do with the writing; but it is interesting that it prompted the examination. He wrote:

Dear Mother,

I am sad quite, and I cannot stay. And I am worry more. I cannot be happy because I am scad. See I am killed now and off right now for life time. From your son, J— S—.

The patient who wrote this letter is in the ward at present and looks perfectly well. Most of the time he is perfectly rational and is above the average intelligence for his age. For several days he cried without evident cause, feared any stranger he saw coming into the grounds, and was destructive.

In the early cases the temperature is often high, and in the fatal cases may reach 108 or over; in one case it reached almost 109. In the late cases there is often no rise of temperature, and the patients go about the wards apparently well. Adults as well as children exhibit this edema.

Is there not a direct relationship between the cerebrospinal pressure and the cutaneous circulation? If the cerebrospinal pressure is high, so high that a child lies in an almost comatose condition with his eyes rolled up out of sight and is only partially relieved by lumbar puncture, and there should occur an intense urticarial rash covering the whole body followed by a restoration of the cerebral functions to normal within a few hours; if a temperature of 103 or higher should at the same time fall within twelve hours or less to normal and remain down thereafter; and if this phenomenon has been observed not once but many times, sufficiently often, in fact, to enable one to prognosticate the course of the temperature and the end-results of the illness every time, is one justified in stating that there is a balance of pressure between the two, the increase of one automatically reducing the other and favoring the absorption of the exudate? That such a deduction is correct I submit, and it is to this fact that appeal may be made in explaining the cerebral type of the infectious diseases; and it would seem that embryology will aid in establishing the correctness of the deduction, as the brain and the skin are developed from the ectoderm. May I refer again to our poliomyelitis cases in support of this hypothesis? Sweating was a notable feature of some patients, and was particularly marked in several very severe cases. Those that had an involvement of all extremities with or without the involvement of the neck and trunk muscles, those that were most seriously affected, were the ones that exhibited this symptom. Of eight cases in which this was a very marked feature the perspiration standing out in beads on the lips and forehead, every patient had a clear brain. They were notably excited and talkative, but rational. All were discharged from the hospital in an improved condition.

The sweat glands were safety valves. Is there not here an indication for dry hot baths, as, for example, the electric bath with white lights?

Edema of the skin with infiltration of the tissues by leukocytes is a feature of scarlet fever and of the exanthems. If, then, the rash strikes in, as it was expressed by our grandmothers, we would expect to find this edema in that portion of the body that has an interrelationship as to pressure with the skin. From the evidence submitted above we should expect that the cerebrospinal axis would be the part to exhibit this edema, and again I submit that this is what does occur.

REPORT OF CASES

CASE 1.—In 1906, a boy aged about 9 years, who had recently recovered from an attack of measles, presented marked symptoms of cerebral compression and was placed under careful observation. There was no rise of temperature. The boy was up and about daily, was secretive and retiring, and presented many symptoms of melancholia; but he differed in that from time to time he would utter a bawl as though in acute pain. He would look at one with large staring eyes and utter a sound that won for him the name of "bawler"; he would then relax and resume a normal expression, but took no interest in toys or people. He had a ravenous appetite. This condition lasted for several weeks, and then he developed the most marked urticarial rash that I have seen and in a few hours he was perfectly well. The only change noted in this lad subsequently was one reported to me by his teacher, namely, that whereas he had been good in mathematics and poor in reading, he now became poor in methematics and good in reading.

CASE 2.—In January, 1915, G. W., a boy aged 20 months, was admitted to the scarlet fever wards of Willard Parker Hospital, and it was reported that he had been ill four days. He was very toxic, the nasal discharge was profuse, the left ear was discharging, the cervical glands were enlarged, there was no rash, and there was considerable rigidity of the neck and marked retraction. The Kernig sign was negative, the Babinski positive. He was very noisy and restless, and at times had twitching of the limbs, while at other times the limbs were rigid. He was given 20,000 units of antitoxin and also 150 c.c. of convalescent blood. A lumbar puncture was done, and 25 c.c. of clear fluid were removed under very much increased pressure. On analysis, the fluid was reported as negative. The temperature reached about 109 F. There was no necropsy. In this case it should be noted that the rash disappeared unusually early for a toxic scarlet fever case, and there is probably some significance in the occurrence of the profuse nasal discharge and the mental picture.

CASE 3.—R. A., girl, aged 4 years, had been ill five days when admitted to the hospital. The rash was still present, the throat was ulcerated, there was a profuse nasal discharge and 20,000 units of antitoxin and 90 c.c. of antistreptococcic serum were given. A right facial paralysis was noted just forty-eight hours before the ear on that side began to discharge, and the usual onset of postdiphtheritic paralysis was noted. Muscular twitchings, tremors of both hands, and rigidity of the neck were also noted, and the Kernig sign was recorded as marked. A lumbar puncture was done and 25 c.c. of clear fluid, under greatly increased pressure, were obtained. The temperature ranged between 103 and 107. She died on the fifth day in the hospital. There was no necropsy.

CASE 4.—J. Q., boy, aged 9, a scarlet fever patient, had a moderate rash, patchy and pink. The Schick test was negative, and he had exudate on the tonsils. A culture was positive, but no antitoxin was given. He was very delirious, had no rigidity of the neck, a slight Kernig sign, the reflexes were increased, and the eyes reacted to light. A lumbar puncture was done and 20 c.c. of clear fluid were removed under slightly increased pressure. The cells were not increased; bacteriologically it was negative, while chemically the albumin was +, globulin + and Fehling's test +. The patient was given fluidextract of ergot for five days. The boy slowly improved mentally, and at the end of two weeks his temperature first became normal but did not remain so. The Widal test was negative. One of the nurses noted that he slept a great deal. He was very hard to arouse.

CASE 5.—M. S., boy, aged 8 years, had scarlet fever. He had been ill seven days on admission, and had no rash. His temperature was 105.6 on the first day, probably due in part to 15,000 units of antitoxin. By the end of the week it reached 99 regardless of the fact that he was given 240 c.c. of fresh blood, and had enlarged glands and an otitis. This lad was very hard to restrain, and many things were tried to quiet him but without marked success. He had the same haunted staring and pained expression noted in Case 1. No lumbar puncture was done. He made a good recovery eventually.

CASE 6.—MRS. A. S., aged 34, had been ill four days when admitted. On the fourth day in the hospital her temperature was normal and she was desquamating; but she was very nervous and delirious; in fact, she died in this condition. A lumbar puncture was done shortly before death, and 25 c.c. of turbid fluid under some pressure were removed. The bacteriologic examination was negative, while the albumin was ++, the globulin ++, and the Fehling test +++.

CASE 7.—P. F., boy, aged 3 years, admitted to Willard Parker Hospital in November, 1915, had a normal temperature for three weeks; then it rose to 104 and recessed to normal almost daily. The cervical glands were slightly enlarged, but there was no suppuration. At the end of the fourth week he was stupid and dull, and an examination was made with the somewhat negative results. The pupils were equal; there was a tendency to look upward more or less constantly; the eyes were slightly suffused; they reacted to light. There was no clonus. The knee jerks were slightly increased, more on the right. There was no retraction of the neck nor rigidity. The patient gradually improved and was discharged.

CASE 8.—S. P., girl, aged 9 years and 6 months, had been ill one day when admitted to the hospital in June, 1916. She did not appear to be very sick on admission, but twenty-four hours later her condition had changed and she became restless and at times delirious. She retained little nourishment, and became very thin and emaciated in a week. Her whole illness was out of proportion to her throat symptoms, and it should be remembered that the severity of scarlet fever varies directly with the throat. Her rash, throat and tongue were typical of scarlet fever, but the clinical picture had an added feature that was unusual. Twice she was given blood intramuscularly, first convalescent and later normal blood. A blood culture was done, but it was negative, and a lumbar puncture was done and 20 c.c. of bloody fluid were obtained. The patient died on the tenth day in the hospital, and fortunately the parents consented to a necropsy.

On removal of the brain, many granular, sandlike bodies were noted which seemed to be far in excess of the usual number of arachnoid villi or pacchionian bodies. The brain was congested and was heavier than usual, and was markedly edematous. The ventricles were practically normal other than for some distention. The consistency was about normal. After the removal of several fairly large sections for pathologic study, the brain weighed 1,256 gm., and I believe that intact it would have weighed quite 1,260 gm., as the sections removed were very large. The sections were fixed in Bouin's solution, of picric acid, 75 parts; formaldehyd solution, 25 parts, and acetic acid (glacial), 5 parts. The cerebrum showed a notable proliferation of vessels with perivascular edema and leukocytic infiltration. About the pyramidal cells there was a zone of edema, and in the reticulated structure there was also evidence of the same condition. Practically the same things were noted in the cerebellum, the cells of Purkinje being surrounded; and in many instances they appeared to be insulated by the edema, that is, they were practically cut off from the tissues about them. In this area reticulated fibrin was seen. In the white matter there was also perivascular edema with cellular infiltration. The greatest amount of edema was to be found in these sections of the cord; in the white matter the nerve fibers were surrounded by large areas of edema, and the gray matter showed the

same picture as noted in the cerebrum. The choroid plexus was chiefly interesting because of the presence of numerous psammoma bodies.

CONCLUSIONS

1. Edema of the brain occurs in the infectious diseases.
2. Its presence not infrequently masks the symptoms of the disease in which it is due, and it may be considered as a type per se.
3. The primary involvement may be that of the central nervous system.
4. There is an interrelationship between the cerebrospinal pressure and that of the cutaneous circulation. This relationship is one of direct variation.
5. The outbreak of a marked cutaneous eruption in a case presenting symptoms of intracranial pressure is a favorable prognostic omen. These patients recover.
6. Lumbar puncture is indicated in these cases.
7. White light electric baths, in that they favor an increased cutaneous circulation, are beneficial and are preferable to hot tubs of from 105 to 110 F., though the latter are productive of good results.

25 West Forty-Fifth Street.

CARDIOVASCULAR EXAMINATIONS OF FIFTY-FIVE THOUSAND RECRUITS

GEORGE EDMESTON FAHR, M.D.
Contract Surgeon, U. S. Army

Assisted by Lieuts. D. W. Carter, M.D. (Georgetown, Texas); J. H. Cosgrove, M.D. (Duluth, Minn.) and J. D. Edgar, M.D. (Henry, S. D.)

CAMP TRAVIS, FORT SAM HOUSTON, TEXAS

There is no reason why diseases of the heart should not be given equal rank with tuberculosis, for in civil life they result in at least as many, if not more, deaths. In the Allied armies more disability is due to cardiovascular disease than to tuberculosis. The recent report to Parliament showed that of the 350,000 men in the British army discharged and pensioned for wounds and diseases, a little over 10 per cent. were for heart disease and about 11 per cent. for chest complaints and tuberculosis. When we consider that whenever tuberculosis is found in the soldier he is discharged and pensioned, whereas very many of the men with cardiovascular disease are not discharged but are merely put in deferred classes of the Army, we see that circulatory diseases are undoubtedly of more importance to the Army than tuberculosis. It will surprise many to know that there are two and one-half times as many pensions for heart disease in the British army as there are for the loss of limbs, and nearly twice as many as for nervous diseases, shell shock and epilepsy together.

The cardiovascular board examining recruits at Camp Travis, Texas, has completed the examination of 55,000 men and finds itself in possession of information interesting from the standpoint of statistics as well as instructive to the local boards in their efforts to limit the number of men sent to the training camps who are unable to undergo severe bodily exertion because of circulatory diseases.

The system of examining recruits at Camp Travis at present is briefly as follows: After arriving at the camp, the recruits are marched in a body to the receiving station, where they receive their papers from the personnel board, are stripped, given a shower bath, and then sent to the various special boards examining in the same group of buildings. The last board to examine them is the cardiovascular board. This board has its quarters in the quietest wing of the building. The two members of the cardiovascular board working in this building simply attempt to pick up cases for more thorough examination. It is thus possible for two examiners to complete the examination of 1,500 men for cardiovascular disease in one day. An attempt is made to differentiate murmurs due to valvular lesions from purely accidental ones and to select as far as possible only such cases of tachycardia for more thorough examination as show the other symptoms of irritable heart or hyperthyroidism. A much more extensive examination is then given the selected cases by the third member of the board, who has his quarters in an adjacent building with the discharge board of the camp. After this examination, the recruit is classified and accepted or discharged.

The two members performing the first examination usually consult over each case before sending it to the discharge board, and the member of the cardiovascular board working with the discharge board consults and discusses the difficult and ambiguous cases with the other two members constantly so that no man is discharged from this camp without a thorough examination and critical discussion, unless the case is a very simple one. The cardiovascular board has also learned much from examination of a large number of enlisted men of the Ninetieth Division now stationed abroad. The board also receives a certain number of men from the training battalions into which the men had been inducted after the first cardiovascular examination, for reexamination and reclassification, who have been found unable to stand up at drill, showing signs of dyspnea, precordial pains or fainting on exertion.

We believe that our figures show approximately the amount of valvular heart disease incident to young men in the ages from 21 to 31 living in the states of Texas and Oklahoma. We can hardly believe that the majority of the local boards sending men to Camp Travis are capable of picking up many cases of valvular diseases of the heart. In the earlier draft increments, we found twelve men in 10,000 troops with aortic insufficiency, presenting symptoms of a large heart pulsating strongly in the axillary line with loud diastolic murmurs at the sternum and often at the apex, with typical Corrigan pulse and all the features of outspoken aortic disease, marked by local boards "heart normal." The last two increments yielded a smaller percentage. The last increment of 19,000 men yielded only eighteen cases. We have found the same to be true of mitral diseases. Local boards which could not discover the majority of the cases of aortic and mitral insufficiency discharged by us would certainly reject extraordinarily few of the cases of organic heart disease passing through their hands. Undoubtedly, however, the excellence of the work done by the local boards varies from board to board, so that our statistics do not give the actual percentage of young men suffering from these diseases; but they certainly give the order of magnitude of the incidence of valvular disease at these ages in these states.

AORTIC INSUFFICIENCY

We found fifty cases of aortic insufficiency in examining 55,000 recruits, that is, 0.09 per cent. With

only a few exceptions, these were outspoken cases with loud diastolic murmur heard all over the sternum and often at the apex, with hypertrophy to the left, with Corrigan pulse, with high pulse pressure and all the other classic signs. In a few cases the murmur was very soft and faint and the hypertrophy slight. One of these men was a university athlete, a high and broad jumper. He was at the time of the examination able to undergo severe bodily exertion, but he had all the signs of aortic insufficiency and a history of polyarthritis in childhood. One of the most interesting cases was that of a Texas cowboy, a man who had been a "broncho buster." This man had once noticed while riding a wild horse that something seemed to break behind his chest bone and that there was pain present behind the sternum for some time. There was a high pitched musical diastolic murmur heard over the second intercostal space to the right and left and over the sternum. The pulse pressure was only a little larger than normal, there was no hypertrophy, and there were no signs of dyspnea on hopping. The man professed to be able to do hard work, but had found it necessary to give up broncho busting. It would appear that we might have here one of those rare cases of a rip in one of the semilunar leaflets brought about by a strain and trauma. Of course it is impossible to verify this without the records of examinations previous to the occasion when the accident supposedly took place. It is interesting to note that only once did a local board mark a case of aortic insufficiency anything but normal. In this one case in which the aortic diastolic sound was especially loud, was heard at the apex as well and was accompanied by an apex beat in the axillary line and by relative mitral insufficiency, the local board marked its findings "apex sound prolonged."

Most of the cases of aortic insufficiency were undoubtedly due to polyarthritis. In many of the cases there was also a history of syphilis; but the syphilis had been acquired only a few years before. In these young men with a history of polyarthritis, tonsillitis and syphilis it seems most probable that the lesion is rheumatic in etiology. The incidence of aortic disease in the colored race was slightly greater than in the white. Most of these afflicted with this lesion were doing hard labor. Some of them certainly appeared capable of the severe bodily exertion demanded of soldiers. In fact, they were often physically better than those whom we discharged for irritable hearts and in whom there was no valvular lesion. As long as the leakage is only slight and the heart muscle is capable of doing the extra amount of work necessitated by the leakage, these hearts respond very well to a call for severe exertion. It is later, when the increasing leakage puts an increasing handicap on the heart muscle and when the heart muscle begins to weaken, that these men notice symptoms. Pain over the sternum is often for a long time the only complaint. In this connection, we recall some cases of aortic regurgitation seen at Nauheim during the early period of the war. The men had served their period of enlistment years before, had developed an aortic regurgitation in the interim and were mobilized after a very superficial examination at the beginning of the war. These men were farmers and laborers and went through many days of hard marching with 75 pounds on their backs. At a time when men with healthy hearts began to be exhausted from the forced marches through Belgium and Russia, these men began to show signs of heart failure; pain, dyspnea, swollen ankles and hemoptysis. When once this exhaustion of their cardiac muscle had taken place, it seemed to be accompanied by a permanent impairment of the cardiac reserve, so that these men who had been mobilized as efficient laborers had to be discharged after treatment at the spa as partial invalids capable of only light work. For this reason, we are convinced that it is best to exclude all men with aortic lesions, even when the leakage appears slight and the heart muscle capable of taking care of it.

MITRAL INSUFFICIENCY

There were thirty-nine cases of mitral insufficiency unaccompanied by another lesion, that is, 0.07 per cent. It will probably astonish many who believe that mitral insufficiency is relatively a very common valvular lesion. On the other hand, we believe that those who have had considerable experience with heart disease, both clinically and pathologically, will agree that mitral insufficiency of endocarditic origin and uncomplicated by mitral stenosis is relatively not very much commoner than aortic insufficiency. Relative mitral insufficiency accompanying myocarditis in the middle aged and old, or associated with other valvular lesions, is relatively, of course, very common. There has been a tendency to consider a loud systolic murmur at the apex pathognomonic of mitral insufficiency. Many of these murmurs are undoubtedly not due to valvular lesions at the mitral orifice. It is true that the members of the local boards will undoubtedly pick up and discharge more cases of mitral insufficiency than aortic insufficiency because the mitral systolic murmur is much more easily recognized than the softer aortic diastolic murmur. On the other hand, we cannot believe that the local boards have picked up and discharged very many cases of simple endocarditic mitral insufficiency, for these boards have sent to camp a large number of men with loud systolic murmurs which on careful examinations have turned out to be accidental murmurs, but which had not been noted by the local board.

ACCIDENTAL MURMURS

Our experience in reviewing the findings of physical examinations at one of the largest universities in the country and as members of medical advisory boards, as well as here at Camp Travis, have shown us that the average practitioner has not had the great incidence of accidental heart murmurs in the young impressed on him sufficiently. We have never forgotten the case of one of our college classmates who was advised against taking part in athletics because he had a "leakage of the heart." This man became famous as a cross-country runner and as 2-mile champion both here and abroad to the astonishment of the examining physician, who had heard a systolic murmur. We have seen numbers of young men turned down by the examiners for the Aviation Corps and the Navy for nothing more than systolic accidental murmurs, some of them heard in the second interspace. Some of the men appearing before us for examination present statements from one or more physicians vouching for their inability to become soldiers because of valvular lesions. All these men show nothing but simple accidental murmurs. Every cardiac consultant can recall many young lives at least temporarily blighted by one of these diagnoses. One of the men examined by us had been turned down by the local board with the statement,

"Physically deficient by reason of cardiac murmur." The advisory board had diagnosed it "mitral regurgitation," but for some reason had passed the man. The murmur was an accidental one heard best in the third left interspace. The etiology of mitral regurgitation in this case will certainly be of interest to the readers of this article. The young man had been in love with a girl. He had bought himself a homestead, had worked hard on this, doing his own house work as well as field work and hoped finally to lead the blushing bride back to the farm which he was preparing for her. When all was ready, the girl turned him down. According to his statement, this caused him heart trouble. On close questioning his trouble seemed to be more in his stomach than in his heart, and we felt that despite this very real "heart" trouble he might still make a good soldier.

We found that 3.2 per cent. of all our recruits have an accidental murmur; and by accidental murmurs we do not mean reduplicated and impure first sounds but real murmurs with a swish or rumble, often very rough and loud, and in quality indistinguishable from the murmurs associated with real organic lesions. As Lewis has insisted, in the examination of English soldiers, "neither the quality, intensity nor transmission of a murmur is sufficient for distinguishing it." There is a soft systolic murmur usually disappearing on recumbency which most physicians distinguish as an accidental murmur, but many of the loud, rough systolic murmurs transmitted into the axilla lead to the diagnosis, "mitral insufficiency." In one of the latest American works on the physical diagnosis of the chest we find the false statement that "accidental murmurs are never loud and rough." It must be insisted on that whenever there is an organic insufficiency at the mitral valve of any importance, the left ventricle must dilate in order that the heart may do the extra amount of work set for it and pump out the increased minute volume. The regurgitation of blood backward must lead to increased pressure in the pulmonic circulation with accentuation of the pulmonic second sound and dilatation of the left auricle. Without hypertrophy and signs of embarrassment of the pulmonic circulation, there should be no diagnosis of mitral insufficiency excepting, of course, when the physician has heard a systolic murmur developed during or following rheumatic fever or other infections. Even then the diagnosis must be made with reserve unless the other signs are present. We recall here the case of a recruit recently examined by us. He had been rejected for the Texas cavalry because of an extremely loud and rough systolic murmur. This boy had two typical attacks of polyarthritis in childhood. When we examined him, the pulse rate was 108; but the young man told us he had many times examined it himself and had always found it to be 70. The apex beat was well within the midclavicular line. Percussion of the left border showed it also inside the midclavicular line. The pulmonic second was louder than the aortic but not accentuated; the response to effort was good; he played baseball and was a good swimmer. We were all agreed that despite the history of polyarthritis in this case, there was practically no regurgitation through the mitral valve. We do not care to discuss here what may be the causes of these murmurs; but we do wish to point out that the loudest systolic murmur unaccompanied by definite signs of pathologic anatomy and of pathologic physiology in the circulation should not lead to a diagnosis of valvular lesions. The left auricle in contradistinction to the left ventricle cannot be burdened with even moderate amounts of regurgitated blood without embarrassment to the pulmonary circulation.

Good judgment must also be exercised in making use of a pulmonic second sound louder than the aortic. The pulmonic second is usually louder than the aortic in men at these ages, especially when recumbent. If the pulmonic is not merely louder but is accentuated or reduplicated, this evidence is in favor of the diagnosis of mitral disease. But we have found cases with reduplicated and accentuated second pulmonic sounds in hearts without murmurs or hypertrophy and with no symptoms.

The determination of hypertrophy of the left ventricle is fraught with uncertainty in many cases if percussion and position of the apex beat are the only means for determining the left border of the heart. It should be emphasized that the apex beat is not always a reliable index of the position of the left border. Usually the apex beat is inside the left border of the heart as determined by the orthodiagram or accurate percussion; but sometimes the apex beat is one or more centimeters outside the left border as determined by the orthodiagram, especially when the heart is overactive. Hypertrophy of the left ventricle was once diagnosed in the author by a very good clinician because the apex beat was strongly felt in the anterior axillary line. An orthodiagram of the heart showed the left border to be well within the normal limits. This led to the investigation of a number of thousands of cases by Professor Weber at Nauheim. It was found that many patients with supposed dilatation determined by the position of the apex beat and sent to this spa for treatment showed normal orthodiagraphically determined borders, the real apex being seen on the fluoroscopic screen of the orthodiagram to be pulsating well inside the nipple line. In the course of our examinations of 55,000 men we have found the apex beat in many cases outside the nipple line in hearts whose border as determined by roentgenoscopy or percussion was inside the nipple line. This was found to be especially the case in those chests in which the thorax suddenly curved posteriorly before the nipple line was reached. In these chests the thrust of the apex is propagated out beyond the actual position of the apex in the frontal plane. We believe that careful percussion conducted in a very quiet room by physicians who have practiced and carefully controlled their percussion orthodiagraphically in hundreds of cases is often superior to the palpation of the apex beat in determining whether a hypertrophy is present or not. Of course, whenever possible, roentgenographic methods, making use of parallel rays, are the methods of choice.

The response of the heart to effort may aid in determining whether the possessor of a systolic murmur has an organic heart lesion or not. But this may also leave us in doubt, for many cases of irritable heart that have a poor response to effort also show a systolic murmur. Critical judgment and an extensive experience in the physical signs of normal and pathologic hearts is indispensable in finally deciding where to place certain cases; but usually we have not found it difficult to determine when a systolic murmur is the sign of a real organic lesion at the mitral valve. We desire again to emphasize the great value which per-

cussion of the heart borders, combined with a comparison of the orthodiagram of the heart, has been to us personally in determining the accuracy of our percussion. We have had success in the teaching of percussion to students by this method. If this method were followed in all our medical schools, we feel that there would be fewer diagnoses of left ventricular hypertrophy, on hearing murmurs that are undoubtedly accidental.

The greater part of the accidental murmurs (2.5 per cent.) were systolic and loudest over the apex. About 0.6 per cent. of all the recruits showed systolic murmurs loudest over the second left intercostal space. Only about 0.2 per cent. showed pronounced cardiorespiratory murmurs. About 0.2 per cent. showed murmurs loudest over the second right interspace and transmitted into the carotids. There were none of the other symptoms of aortic stenosis, and neither roentgenoscopy nor percussion showed any enlargement of the arch. There were no symptoms, and therefore both aortic stenosis and aortitis being reasonably surely excluded, the diagnosis of accidental murmur was made. There were four recruits (less than 0.01 per cent.) found with diastolic murmurs after due deliberation classed accidental. These murmurs are very soft and usually heard only in the earlier parts of diastole. They are usually influenced by respiration, nearly disappearing on inspiration. There is no history, and there are no symptoms nor any signs of aortic insufficiency associated with these murmurs. In one case there was a peculiar diastolic murmur heard over the second right interspace over the whole of the lower sternum and to the right of it when the recruit was standing. This murmur was increased on expiration but did not disappear on inspiration. In the recumbent position, there was no diastolic murmur heard, its place having been taken by a soft systolic respiratory murmur. The blood pressure was 130 and 80; tonsillitis was the only disease in the patient's history. There was no hypertrophy, and the recruit had never experienced dyspnea or pain over the chest; in fact, he remarked that he always feels well. Here again, we see that no one symptom alone is pathognomonic. Time and again we have had cases in which there was no pathologic condition referred to us with a diagnosis made from one symptom alone.

STENOSIS, HYPERTROPHY AND OTHER CONDITIONS

Mitral stenosis is apparently very rare in the states of Texas and Oklahoma. We have found only ten cases of undoubted mitral stenosis (presystolic murmur, accentuated second pulmonic, typical mitral outline) in an examination of 55,000 men. Rheumatic fever is probably very uncommon in these states. We have been very careful not to diagnose a mitral stenosis unless there was a definite typical presystolic murmur with accentuation of the second pulmonic sound.

We are altogether opposed to making a diagnosis of mitral stenosis from a loud, slapping first sound. If there is no presystolic murmur or thrill, there is no stenosis in these early stages. We have never been able to confirm Mackenzie's statement that the presystolic thrill is to be felt before the murmur is developed. At least by the man of slight cardiovascular experience, the presystolic thrill alone should never be used to diagnose a case. There are certain impurities of the first sound suggestive of presystolic murmurs that have led to the diagnosis of mitral stenosis. Some years ago we showed by graphic records that there are a few sound vibrations in the first 0.1 second preceding the normal first sound.[1] In some individuals, these vibrations have considerable amplitude. In one man investigated by us graphically, these vibrations varied in amplitude, on some days being loud enough to cause an impurity of the first sound. But these impurities are never as loud nor as prolonged nor of cresendo character, and so far as our experience goes never accompanied by the loud, slapping first sound of mitral stenosis. Exercise usually causes them to disappear, whereas the true presystolic murmur of mitral stenosis is increased in duration and intensity after exercise. The impurities should not cause the cardiovascular examiner any trouble if he is careful to consider all factors. The presystolic sound of mitral stenosis is not easy to recognize, and it is very probable that only such cases as were badly decompensated were recognized by the local boards. We believe that our figure for the incidence of mitral stenosis gives a tolerably fair idea of the order of frequency of this disease in Texas and Oklahoma.

We have found aortic stenosis complicating very few of our cases of aortic insufficiency. We have found no case of uncomplicated aortic stenosis. There have been many cases with a systolic murmur on the second right interspace and transmitted into the carotids, but unaccompanied by thrill over the interspace, by the typical pulsus durus and the faint second aortic sound. These cases have always been classified as accidental murmurs.

There were six cases of idiopathic hypertrophy with no apparent cause. There was no hypertension at the time of the examination, and it was not possible to observe these cases over a long period. Very possibly the hypertrophy was associated with periodic crises of hypertension. Ten recruits had hypertension, that is, a systolic pressure continuously above 160 mm. There were symptoms of nephritis in only one. One case suggested Pal's vasomotor crises. This man gave a history of attacks with severe pain over the chest, throbbing in the head, flushing of the face and headaches. His blood pressure was very labile during the period that we had him under observation, the systolic pressure ranging from 170 to 220.

Among the rare heart diseases we found one case of heart block with a rate of 38 and Stokes-Adams syndrome. There was no increase in the rate on exercise or after atropin. There was a history of syphilitic infection two years before. The fainting spells began five years before so that syphilis probably has no connection with this case of heart block. We also found one case of patent ductus arteriosus with a typical to and fro murmur in the second and third left interspaces transmitted to the interscapular region on the left side, with a loud second pulmonic sound, and pulsation in the third left interspaces. There was no hypertrophy, and the man felt perfectly capable of every exertion. He was accepted for service. There was one case of congenital septum defect, marked cyanosis since birth, clubbed fingers, moderate dyspnea on slight exertion, a loud systolic murmur heard best over the lower end of the sternum and to the left of sternum in the fourth interspace. This murmur was transmitted to all parts of the anterior chest wall and

1. Fahr, G. E.: On Simultaneous Records of Heart Sounds and Electrocardiogram, Heart 4: 147, 1912.

also into the back. The second pulmonic sound was loud. There was no enlargement to the right. We believe that the best guess in this case is patent foramen ovale. There was one case of dextrocardia with situs inversus. There were only seven cases of hyperthyroidism.

Excepting for the respiratory arrhythmia, common at this age, irregularities in rhythm are fairly rare. We have found that about 0.05 per cent. of all have extrasystoles of ventricular origin with no other pathologic condition. Sometimes they were associated with bigeminal pulse, and sometimes with no pulse following the second systole of a coupled beat heard at the apex. Usually these men were conscious of a compensatory pause, stating that their heart missed beats. It is customary for these extrasystoles to disappear entirely in a day or two after the excitement of mustering is all over. In the examination of 55,000 men, we have found but one case of pulsus irregularis perpetuus, a case of mitral stenosis and insufficiency with a soft diastolic murmur at the apex.

NEUROCIRCULATORY ASTHENIA

The condition previously known as irritable heart, but recently better designated as neurocirculatory asthenia, is by far the most important circulatory disturbance, both to the medical officer culling out at the recruiting station and to the medical officer examining at the front. For example, the report of one of the British base hospitals in France shows that out of 5,000 soldiers examined for circulatory failure only 5.5 per cent. had organic lesions and about 86 per cent. showed the condition known as irritable heart. In fact, the diagnosis of irritable heart is so much more important to the military surgeon than the diagnosis of organic lesions that Lewis makes the somewhat radical statement that the military heart specialist has no use for a stethoscope. Our experience at this camp seems to show that about 0.4 to 0.5 per cent. of all the recruits should be discharged for inability to stand up under severe bodily exertion because of neurocirculatory asthenia.

A brief description of the symptomatology of neurocirculatory asthenia[2] is perhaps not out of place at this point, especially as the condition has heretofore been described as seen at the front and not as observed in the training camp. Neurocirculatory asthenia, or the irritable heart of the soldier, as it is often designated, is not a condition determined by the exertions and emotional upsets of military life alone. This condition always exists among civilians. Careful inquiries have shown that among a large number of those who break down at the front with this disease, the symptoms were already present in civil life. The severe bodily exertion and the emotional stimuli associated with modern wars serve to bring out and emphasize this condition. Moreover, it is peculiarly inherent in the modern methods of conducting warfare. When military service is confined to a class who practice it voluntarily, irritable hearts will be few, because the possessor of the constitution of the neurocirculatory asthenic usually does not seek the strenuous life of the soldier. He is the type of man who avoids strenuous physical exertion and strong stimuli. Modern armies are obtained by drafting all men within certain age limits; and these more timid, less strenuously inclined individuals are taken along with the rest.

The effort syndrome is the peculiar characteristic of neurocirculatory asthenia, namely, an exaggerated response to physical exertion and emotional stimuli. Slight physical exertion produces marked dyspnea, greatly increased pulse rate, a feeling of fatigue, and very frequently pain over the precordium. Even the slight emotional stimulus of the physical examination will cause sweat to trickle down from the arm pits or stand out in beads over the foreheads, or will cause a flush to appear in the face, and the pulse rate always goes up to from 120 to 150. Many of this class have cold, clammy hands, and show a coarse tremor of the fingers or of the lower limbs during the examination. In other words, very slight causes produce great effects in these individuals. They are the men who in civil life drifted from one occupation into another. Many of them are clerks, others are sign painters, barbershop porters, any occupation that involves little exertion. Here in Texas, many of them, born as farmers, remain in this profession; but they give a history of avoiding severe bodily exertion. They almost invariably give a history of being unable to stand heat. They are subject to giddiness when forced to work in the hot sun, and are compelled to go into the shade to rest and cool off, when other men stick to their work. In other words, they are not first class men but belong to the constitutionally inferior class.

If these men are accepted by the recruiting authorities, it is noted that throughout the course of training they are continually falling out at drill, and they complain of weakness, pain over the heart, palpitation, inability to stand the hot sun, and inability to sleep after a hard day's work. They are often looked on as malingerers, and undoubtedly often they are when judged by our present standards. The company commanders like to get rid of them, transfer them, if it is impossible to get them discharged. If finally taken to the front, they are usually sent back to the base hospitals because the severe bodily exertions and emotional disturbances there are too much for them. Desire for alcohol and development of the sexual instinct have always been looked on as indicative of strength in men. As a class the neurocirculatory asthenics are not attracted by either Bacchus or Venus.

Neurocirculatory asthenia is probably not primarily a disease of the heart, but symptoms are due to an overexcitability of the autonomic nervous system, an irritable weakness of the vegetative nervous system. The rate of pulse at rest is always increased over that of normal individuals, owing to an increase in the tone of the accelerator nerves. Vagus tone seems to be normal. The increased activity of the sweat glands and the heightened response to the action of pilocarpin show that the parasympathetic system innervating the sweat glands has increased tone. The response to epinephrin is increased over that in the normal, showing increased excitability of the vasomotors. Many have marked sinus arrhythmia, showing that the centripetal vagus fibers from the alveoli of the lung are hyperexcitable. Many of these men show decided neurotic or psychoneurotic symptoms. We believe that all of the nervous symptoms can be explained on the basis of changes in the tone of the nervous systems, especially the vegetative.

In the foregoing we have been describing the most common type of neurocirculatory asthenic. At the

2. Lewis, Thomas: Report upon Soldiers Returned as Cases of "Disordered Action of Heart," Medical Research Committee, 1917; Report on Neurocirculatory Asthenia and Its Management, Mil. Surgeon **42**: 409, 1918.

training camps one encounters another class, less frequently. In the latter class there are no signs of constitutional inferiority. These men give a history of having done hard work, of having played games, etc., until a severe infection, usually typhoid, pneumonia or influenza, was followed by a slow and incomplete recovery. From this convalescence they invariably date their inability to undergo severe exertion. The men in this class usually appear fit to the eye, but the exercise test is followed by dyspnea and distress and a marked increase in pulse rate, which does not go down for five minutes or more. These cases show the cold, cyanotic hands, the sweating and the coarse tremors less frequently than the cases that are associated with constitutional inferiority and psychoneurotic symptoms. Tachycardia is also present in these cases when they appear for examination. They correspond to the cases of Group 2 of Oppenheimer and Rothschild.[3]

The tachycardia is the symptom that draws the attention of the cardiovascular examiner to these men. The excitement of the examination and of the new environment tends to increase the pulse rate in all men; but, as stated before, the increase is greater in this class than in normal men. Of course, men having hyperthyroidism, men with high temperatures or recently recovering from infectious diseases, and men under emotional stress will also show increased pulse rate. After noting the increased rate, it becomes the duty of the examiner to classify the case. The hyperthyroid cases will show enlarged thyroid, eye symptoms and the characteristic fine tremor. They will usually give a history of loss of weight with good appetite, of much sweating and a "flying off the handle." Men recovering from infectious diseases will give the history. Many of those suffering from neurocirculatory asthenia will also give a history of infectious disease; in fact, as stated above, it would seem from our observation that typhoid fever, tonsillitis, pneumonia and influenza are often directly associated with the causation of this condition. We lay great stress on a history of inability to do hard work, wandering from job to job, precordial pain, lack of desire to play games, to swim, to skate, to take part in young men's activities, dyspnea on slight exertion and palpitation. A history of infectious disease followed by the symptoms of irritable heart is equally important; in fact, there should be no diagnosis of neurocirculatory asthenia without a typical history.

The objective examination is conducted as follows: The pulse rate is taken with the soldier standing and recumbent. The recruit is then made to hop 100 times on one foot. The pulse rate immediately after exercise and two minutes later are taken in recumbency. The typical case of irritable heart will show a marked difference between the rate recumbent and the rate standing. The heart reacts strongly to what is normally a very slight circulatory change. Hopping a hundred times is very mild exercise for the normal man, and the heart rate increases only moderately. There is only a very slight increase in breathing, and there is no distress. The circulatory asthenic shows distressing features, becomes markedly dyspneic, the pulse rate increases alarmingly, and the recruit is glad to lie down on the bed. After two minutes, the pulse rate in the normal returns to within a few beats of the preexercise recumbent rate. In fact, it usually is a few beats less, whereas, in the irritable heart, the rate does not come back within two minutes and there is often dyspnea after this period. The so-called effort syndrome, this exaggerated response to light physical exertion and the poor "come-back" is the most characteristic feature of neurocirculatory asthenia. It alone is not sufficient for the diagnosis, because in reconvalescence, after inoculation and during certain emotional states, the same exaggerated response is often encountered. Before the diagnosis is made, a very careful history must be taken and the examiner must be very shrewd in judging the timber from which men are made.

Many of the negroes come to us with the diagnosis of "heart trouble" firmly fixed in their minds. They complain of precordial or chest pain, especially when forced to work hard. There is a tachycardia and the pulse reaction characteristic of neurocirculatory asthenia, yet there is something about the case that does not impress one as genuine. The dyspnea is often very marked before exercise. In many cases, the rate of breathing becomes much less after exercise and the exaggerated dyspnea is done periodically, a rest from the strenuous contortions of the abdominal and diaphragmatic muscles being necessary. In these cases, the symptoms are overdone to the point of being grotesque. They are simply cases of simulation; but the pulse rate is up, and if one were to judge from one examination, a discharge would probably be given. We therefore insist on repeated examination, and sometimes catch the malingerer on one of his "off days."

For instance, a negro was recently sent to the cardiovascular board from his infirmary for reexamination and classification. He complained of precordial pain and pain in the back, and found it necessary to stop and rest when the drill period was long, because of "weakness" and "shortness of breath." Close questioning brought out the fact that he had a large crop of cotton at home that needed his attention. His pulse rate standing was 156, and in recumbency 124. After exercise his pulse rate went up to 156, and after two minutes rest in recumbency the rate was 124. The exercise produced dyspnea, which seemed exaggerated. It was largely produced by abdominal muscle work. He was asked to return one week later. On our arrival at the cardiovascular examining room on the appointed morning, we found him clutching a post with one arm, bent over with his other hand on the precordium, and his abdominal muscles working with his diaphragm to produce a dyspnea of almost 60 per minute, a picture of intense distress. The pulse rate standing this day was 140, in recumbency 104, after exercise 140, and two minutes later 104.

The dyspnea after exercise was great, but no greater than before We finally decided that this man should be put in a labor battalion, for his pulse rate was persistently high. We told the soldier that we had decided that he was unfit for the work of a soldier, which required a man who could keep going even when he got tired and out of breath, but that he was good enough for a labor battalion, to wield a pick and shovel and clean up latrines. We emphasized the fact that he might have to dig ditches under fire and that his only advantage over the soldier was that he could take a rest, even under fire. A surprised look came over the negro's face, and he began to beg not to be put into a labor battalion. He wanted to wear a uniform and carry a gun. He knew that he could stand hard drilling. We promised to give him another examination in fifteen or twenty minutes. In the meantime he was to sit down and rest. When reexamined, not more than half an hour later, his pulse, standing, was 88, recumbent 68, after exercise 120, and two minutes later 88. There was no dyspnea after hopping this time, and what is more important, no dyspnea of the abdominal type before hopping.

3. Oppenheimer, B. S., and Rothschild, M. A.: The Psychoneurotic Factor in the Irritable Heart of Soldiers, J. A. M. A. **70**: 1919 (June 22) 1918.

We hope that this boy will remain "cured." We believe that the threat of the labor battalion will be a very good prophylactic measure for him and his comrades.

REJECTIONS

The cardiovascular board at Camp Travis has been turning down between 0.3 and 0.4 per cent. of all recruits at the first examination for neurocirculatory asthenia. Later on during the period of training a certain number of men are sent back to the board for reexamination and reclassification, because they have been found to be unable to stand up at drill. At the first examination it is impossible to cull out all, for there is every degree of neurocirculatory asthenia and a small percentage will become fit for the physical exertions of a soldier when carefully trained. When the Ninetieth Division, consisting of about 22,000 men, left Camp Travis for France, about 2,000 men were discarded for physical inaptitude. Of this number, the cardiovascular board picked out fifty as typical neurocirculatory asthenics, that is, about 0.25 per cent. of the strength of the division. This was not the total number of neurocirculatory asthenics with which the Ninetieth Division was embarrassed; a few had been discharged during the training period, and more had been transferred to the depot brigade as inapt for foreign service before the departure of the division. The cardiovascular board has been gradually weeding them out of the camp. They are sent to the cardiovascular board by the infirmary physicians, who well know that these tachycardias are continually being returned to the infirmaries by the company commanders, who can get nothing out of them. In fact, it has often appeared to us that the company commanders are more familiar with the symptoms of neurocirculatory asthenia than the average medical officer. We well remember the remark which one of our friends made before sailing for France with his company. He was describing and discussing the large number of men in his company who could not stand up under hard hikes, who were short winded, and lacked courage and initiative in performing athletic stunts. This officer said:

> Don't the doctors know anything about heart diseases? All these men have poor hearts. They haven't any wind; I have sent them back to the infirmary a number of times, but the doctor will never discharge them. I know they will never be any good when we get them into the trenches. I would rather have a company lacking its full quota than to have the quota made up of these men. They are the biggest handicap I have.

His remarks about the doctors were certainly justified. We have been taught to look for anatomic lesions, murmurs denoting valvular defects. Moreover, there was a tendency in the early period of the formation of our army to keep down the number of rejections at all costs, and of course the cost was paid by lowering the quality of the men. When the cardiovascular board first began its examinations at Camp Travis it was impossible to have men discharged from this camp for neurocirculatory asthenia which was termed "simple tachycardia." Consequently these men got into the division. Many of them had to be transferred back to the depot brigade and are being culled out of that organization gradually at present. Some got across and will have to be turned back on the other side. The manual of instructions for the examining physicians says that a constant rate of 100 or more in recumbency should disqualify. It is a characteristic of the irritable hearts that the difference between the standing and recumbent rate is very large, and many of the typical cases of neurocirculatory asthenia with rates above 120 in standing will go down below 100 on recumbency; besides, the pulse rate alone can never be the only criterion for discharge. The amount of distress after exertion, the history of the case and the appearance of the men are all as important as the pulse rate. At present the cardiovascular board at Camp Travis has carte blanche in discharging its cases. Two hundred and eight men, or 0.38 per cent. of the total number examined, have been discharged for neurocirculatory asthenia. Many of those that we felt should have been discharged during the earlier months of our activity at Camp Travis have since been discharged, either as members of the Ninetieth Division or as holdovers in the training battalion or depot brigade. Some who should have been discharged have no doubt been transferred to other camps. Altogether, we feel that about 0.5 per cent. of all the men arriving at Camp Travis should be turned down for neurocirculatory asthenia. This figure agrees very well with the estimate we have made from the number of cases of neurocirculatory asthenia in the Ninetieth Division, men who were given a fair trial and found wanting after one or two months' service. We want to emphasize again that very few of these men are any good in military service, and we do not believe that very many of them can be made first class soldiers, capable of severe bodily exertion, even when carefully trained. At present there are no special companies for properly training this class of men at Camp Travis, and the only proper procedure is to discharge them as soon as there is certainty of their condition and get them out of the Army. This type of man is naturally disinclined to exert himself. He gets stamped as a malingerer, and very possibly he is of that type; but under no circumstances should the Army be punished for the shortcomings of the man. The Army needs nothing but first class men, and these men are all of them third raters. They are the men who do not succeed in life. They are constitutionally inferior.

There are a certain number of men who, after passing the cardiovascular examination at the camps will pass through a training period as excellent soldiers, and they will go through a part of the campaign in Europe, making good records. Shell shock, gassing, infections attendant on life in the trenches, and lack of sleep, coupled with severe bodily exertion, will make neurocirculatory asthenics out of them. They are of a different type, however, and many, though not all of them, after rest and careful physical training will be returned to their regiments as good or fair soldiers. This type differs from the constitutionally inferior type, which can be culled out at the preliminary examinations. Possibly there is in these cases a certain amount of exhaustion of the myocardium. I saw a large number of these individuals in 1914 at the heart station established by the German army in Nauheim. Many showed a very slight enlargement of the left and right auricular shadows when careful orthodiagrams were made. Electrocardiograms also indicated a slight right ventricular preponderance. These men had been students, office men, business men and in some cases farmers, who had been called from a more or less sedentary life into immediate active service or whose preliminary training had been insufficient for the ter-

rific physical exertion they were called on to undergo. They gave a history of having been forced to march up to 40 kilometers a day in the advance toward and the retreat from the Marne with insufficient nourishment and sleep, and burdened with heavy packs. This resulted in symptoms of breathlessness and precordial pain, inability to sleep, and a soft systolic murmur at the apex which we believe of little significance, and this very slight bulging of the left and right auricle shadows of the heart. The orthodiagraphic work was done by a man who helped to develop orthodiagraphy with Mortiz and who has done this work in an extremely careful way in thousands of cases. There was no question of there being a slight rounding of the figure of the heart, and there was no question about many of these cases showing a slightly depressed Q R S group in Lead I and a high Q R S group in Lead III, all indicative of a period when myocardial insufficiency had been present with regurgitation back through the mitral orifice. Under proper treatment many of these men apparently recovered full myocardial efficiency. It is interesting to note that there was no change in the orthodiagrams or electrocardiograms after the return of apparently good function.

There are a few cases of tachycardia that cannot be classed as hyperthyroidism because the other symptoms of this condition are not to be found. Neither can they be classed as neurocirculatory asthenia, for the typical history and precordial pain is not present. Usually the pulse rate does not go down as far in recumbency as it does in the typical cases of irritable heart. We classify such cases as persistent tachycardia if it is present at repeated examination, and then discharge the men; for it is evident that such hearts "will not stand the gaff." Evans demonstrated some years ago that a heart consumed more energy doing the same amount of work per minute when the pulse rate is rapid than it consumes when the rate is slow. For this reason a heart working at a rapid rate becomes exhausted more rapidly than a heart doing the same circulatory work, but at a slower rate. A slow rate is the characteristic of the well trained athlete's heart. It is a rule that men with persistent tachycardia cannot hold out, other things being equal. The possessor of a heart rate persistently above 100 should be discharged or given deferred classification.

CONCLUSIONS

1. The incidence of aortic insufficiency in Texas and Oklahoma is about 0.1 per cent. between the ages of 21 and 31.

2. Uncomplicated mitral insufficiency of endocarditic origin is comparatively rare, being probably not much greater than 0.1 per cent. for men between 21 and 31.

3. Accidental systolic murmurs at the apex are very common, about 3 per cent. of all men showing them, and they are of practically no significance, unless accompanied by signs of hypertrophy and increased pulmonic pressure.

4. Neurocirculatory asthenia is the most important cardiovascular disease in our army. At least 0.5 per cent. of all the drafted men should be rejected for this condition before the various divisions sail for France.

5. The incidence of mitral stenosis is about 0.02 per cent.; of idiopathic hypertrophy, about 0.01 per cent.; of hypertension, 0.02 per cent., and of hyperthyroidism, 0.015 per cent.

BLOOD-CLOT DRESSING IN MASTOIDECTOMY

MODIFIED TECHNIC WHICH ASSURES PRIMARY PAINLESS HEALING WITHOUT DEFORMITY—PRELIMINARY REPORT

GEORGE E. DAVIS, M.D.
NEW YORK

I wish to add my observations and experience to those of Blake, Reik, Holmes and others in perfecting the technic of the blod-clot dressing in mastoidectomy, a method, I feel, that is destined to revolutionize the after-treatment of mastoiditis.

Recently in a historical review of the institutes of surgery, Sir Berkeley Moynihan[1] observed that "a discovery is rarely the work of one mind. It is one observation added to another that makes the supersaturated solution from which the crystal of truth at last precipitates." This observation was evoked by an allusion to the respective share or credit of Lister and Pasteur for the discovery of the antiseptic system. Moynihan added that "Lister never ceased to give credit to Pasteur for his share in the work that led finally to the development of the antiseptic method."

The foregoing citation is peculiarly apropos to the theme of my text, since the key to the successful employment of the blood-clot dressing in mastoidectomy is wholly dependent on a perfect antiseptic technic, especially as we are dealing always with an infected wound in mastoiditis. The value of the "organized blood-clot" in the healing process was discovered by the greatest of original observers of pathologic conditions, the immortal John Hunter. Long afterward the technic of the blood-clot as a dressing was exploited and made practical use of in surgery on the continent by Schede and subsequently, in this country, by Halsted, Senn, Ochsner and others.

Credit is due Blake of Boston, who, at the suggestion of Sprague of Providence, R. I., first employed it in mastoidectomy. But especially to Reik of Baltimore must be ascribed the most credit for the development or popularizing the blood-clot dressing in mastoidectomy.

Briefly, the technic of the blood-clot dressing as originally practiced in mastoidectomy was to eradicate as thoroughly as possible all diseased tissues, observing strict asepsis, and the blood-clot was admitted at the time of the operation.

The cardinal error of this technic was brought home to me by an observation and experience I had in a radical frontal sinus case which I reported, with the presentation of the patient, to the New York Academy of Medicine in March, 1918, and, by the way, the first and only case on record, so far as I know, in which the blood-clot method was used in this location—the frontal sinus.

In this case a radical Killian operation was done. After removal of the anterior sinus wall, it was observed that the entire sinus floor was necrosed and that there was the complication of a foul postorbital abscess. The necrosis extended so far into the orbital arch that it was necessary to remove this also. The postorbital abscess cavity and the sinus cavity were packed with a continuous strip of iodoform wool and the wound closed, one end of the packing being left protrud-

1. Moynihan, Sir Berkeley: Brit. Medicine in the War, 1914-1917, Tr. Brit. Med. Assn., 1917.

ing from the temporal angle of the wound and the other end coming out through the nose. In twenty-four hours this strip of wool (gauze will answer same purpose) was withdrawn by traction on the nasal end till it was taut to the temporal end, when it was cut at the nasal end, this single strand being left to block the escape of the blood (occasioned by the removal of the rest of the packing) which filled the sinus cavity, preserving the contour of the orbital arch and sinus wall.

Twenty-four hours later the remaining strand of wool was removed. No further treatment was made save an oil spray in the nose during the week the patient remained in the hospital, when he went home healed without deformity and without discharge.

The operation was performed Nov. 9, 1917, and the patient remains well.

It occurred to me that the blood-clot dressing proved a success in this case simply for the reason that the infected wound cavity was first made aseptic by antiseptics at the time of the operation and the iodoform packing preceding the admission of the blood-clot. Therefore the deduction was natural that if an infected frontal sinus wound could be made sterile by antiseptic dressings preliminary to the introduction of the blood-clot, the same could be accomplished in an infected mastoid wound.

From that date I decided to modify the technic of the blood-clot dressing in mastoidectomy, for I was convinced that the incomplete success of the blood-clot dressing as originally adapted and practiced must be charged to a cardinal error in surgical technic: introduction of the blood-clot into an infected wound.

Holmes,[2] in an address on this topic before the Ninth International Otological Congress at Boston in 1912, said that "the success of the blood-clot method in a wound like the mastoid, which can never be made entirely aseptic, depends primarily on eliminating as nearly as possible all infective matter, and secondly on the bactericidal properties of the blood."

From the operative standpoint, therefore, the most expert surgeon may not hope to remove all diseased tissue and bone. He may attain such a degree of success in some cases that the antiseptic properties of the blood may resist any infection that remains, but not so in all cases.

Physiologically considered, the blood-clot dressing as originally conceived was based on the principle that if blood is admitted into a sterile wound of the soft or bony tissues, the clot will organize and facilitate healing, with obliteration of the dead space.

Reik's[3] review of this method from a physiologic point of view probably is familiar to most otologists. Unfortunately the application of this technic in mastoidectomy was not so happy as its conception, nor altogether a rational surgical procedure. While we were admonished that strict sterility of the wound preliminary to the admission of the blood-clot was essential to success, we were advised to do the impossible—to eradicate thoroughly all infected and diseased tissue. Moreover, antiseptics were tabued, only asepsis being allowed.

Therefore, without the aid of the rather marked inherent antiseptic principle contained in the blood-clot, even the best operators with perfect hospital facilities, trained attendants, etc., could not have attained the limited success they did.

2. Holmes, C. R.: The Value of the Blood-Clot in Operations for Acute and Chronic Mastoiditis, Lancet-Clinic **109**: 64, 1913.
3. Reik, H. O.: The Blood-Clot Dressing in Mastoidectomy Considered Physiologically, J. A. M. A. **56**: 935 (March 31) 1906.

What I consider to be a perfected technic that renders the mastoid wound entirely aseptic is the thorough sterilization of the wound with antiseptics at the time of operation, followed by a packing of iodoform gauze that is permitted to remain for twenty-four hours before the blood-clot is admitted.

My technic is as simple as it is effective:

All infected and diseased tissue possible consistent with safety is exenterated. In simple mastoidectomy after thorough exenteration of the mastoid and the establishing of free communication from the antrum into the tympanum, a free incision of the membrana tympani is made and with a piston syringe the tympanum is flushed from the mastoid through the canal with 3 per cent. iodin solution and then with warm alcohol followed with warm sterile physiologic sodium chlorid solution. Then the mastoid is packed with iodoform gauze and closed to the lower angle save for a space that will permit one end of the gauze to protrude.

In twenty-four hours the packing is withdrawn and the bleeding occasioned by its withdrawal allowed to fill the wound cavity. If enough blood is not forthcoming, a nick or cut with a knife or the scissors is made in the angle or margin of the flap to supply sufficient blood to fill the cavity.

The subsequent treatment after turning in the clot in simple mastoidectomy is to close the lower angle of the wound with adhesive plaster with removal of the sutures on the second or third day.

Silkworm gut is used for suture material in this work, and before removal a 3 per cent. solution of iodin is applied to prevent possible infection of the blood clot. The postauricular wound heals in a few days, and as the blood clot supports the soft tissues, there results little or no depression or deformity. The middle ear usually ceases to discharge in a week or ten days, though the time occasionally may be longer.

Following exenteration in radical mastoidectomy, the postauricular wound is closed completely and the mastoid cavity, tympanum and canal are packed with iodoform gauze through the enlarged meatus. The next day the gauze packing is removed and the entire cavity, to the level of the meatus, allowed to fill with blood occasioned by its removal. If sufficient blood is not thus obtained, the tragus is nicked or cut for the balance. The meatus is covered with a film of cotton or layer of sterile gauze, over this sterile petrolatum or other lubricant, and over all adjust an outer dressing which is changed daily. Sutures are removed on the second or third day. Before removing sutures I always apply 3 per cent. iodin along the wound margin and over the sutures, to avoid infecting the deeper tissues and clot as they are being drawn out.

The clot begins to disintegrate in three or four days. The disintegration may be encouraged by the insertion of small gauze or cotton wick-drains saturated with a 10 per cent. solution of phenol in glycerin.

Usually the absorption or disintegration of the clot is complete in two or three weeks, when the bony cavity should be covered with a thin, pink, granular membrane which later becomes smooth, lustrous and fibrous. Should exuberant granulations appear on the median tympanic wall over the oval and round windows, 50 per cent. silver nitrate solution is applied, after the surface has been dried.

I wish to emphasize the importance of thoroughly drying the granulation surface before applying strong silver solutions. This little point in technic prevents pain and reaction, as moisture is essential to conduction of sensation unless undue pressure is made.

The support furnished by the blood-clot before it disintegrates prevents sagging and deformity of the postauricular wound; and as healing is primary, no long, painful packing after-treatment must be endured to wreck the patient's nerves, body and purse.

A short time ago a woman from a neighboring city, who had undergone a simple mastoidectomy nearly three months previous to a visit to New York, was

referred to me by a confrère for further packing while here, as there was still discharge posteriorly from the mastoid and also from the tympanum through the canal. She informed me that she had lost much weight and was a nervous wreck under the care of a nerve specialist, all because of the torturing packing after-treatment. Often she was in bed for a day following a dressing.

The advantages of the modified technic of the blood-clot dressing are:

1. The opportunity to sterilize the wound with antiseptics at the time of operation.

2. The completion and maintenance of this sterility by the iodoform gauze packing of the wound for twenty-four hours, which prevents the infection from the deeper tissues that may occur from the operative reaction drainage when the clot is inducted at the time of the operation.

3. Its simplicity and effectiveness, which enables the average surgeon to use it successfully in or out of hospitals.

REPORT OF CASES

Numerically, the cases in this initial report are far too few to permit sweeping deductions. But with practically a hundred per cent. of primary healing without deformity, quick convalescence, no painful after-treatment, and marked improvement of hearing, even in this very limited series of both acute and chronic cases, with the exception of one acute case complicated with large subperiosteal and perisinuous abscesses, plus a sinus thrombosis in an alcoholic and syphilitic that healed with but slight deformity at the lower angle of the wound where the clot broke down, I am prompted to make this early report, at what seems to be an opportune time, as mastoiditis is prevalent among our soldiers in camp and field. Excepting the acute case with the sinus complication when, as in brain and meningeal complications, the advocates of the blood-clot method advise leaving the wound open, my percentage is perfect in eight consecutive cases from May 19 to August 15.

CASE 1.—M. L., aged 30 years, underwent simple mastoidectomy, May 19, at the New York State Hospital, Central Islip, L. I., for acute mastoiditis complicated with a large cervical glandular abscess. The mastoid wound was packed with iodoform gauze and closed to the lower angle. The dressing was removed in twenty-four hours and the mastoid cavity allowed to fill with blood and the lower angle of the wound closed. The mastoid wound completely healed and there was no discharge from the ear at the end of seven days.

CASE 2.—B. H., girl, aged 11 years, was admitted to the Polyclinic Hospital, June 5, on account of reinfection following an acute mastoidectomy about six months before. A simple mastoidectomy was performed. The tympanum was flushed with alcohol followed by salt solution. The mastoid wound was packed with iodoform gauze and closed to the lower angle. The gauze was removed next day, the wound was allowed to fill with blood, and the lower angle was closed. The postauricular wound healed in six days, but the ear was not dry until two weeks later.

CASE 3.—L. C., boy, aged 9 years, admitted to the Polyclinic Hospital, July 3, had a radical mastoidectomy following incomplete operation five months before. The postauricular wound healed in five days. As the eustachian tube failed to close, some mucous discharge remains at the tympanic orifice.

CASE 4.—J. C., girl, aged 5 years, admitted to the Polyclinic Hospital, July 4, was operated on the following day. A simple mastoidectomy was performed, the tympanum was flushed with alcohol followed with physiologic sodium chlorid solution, and the mastoid wound was packed with iodoform gauze and closed to the lower angle. Next day the packing was removed, the clot admitted, and the lower angle of the wound closed. The mastoid wound was healed in five days, and the ear was dry in two weeks.

CASE 5.—C. G., man, aged 38, admitted to the Polyclinic Hospital, July 19, had acute mastoiditis complicated with a large subperiosteal abscess and a large perisinuous abscess exposing it over a large area, plus a sinus thrombosis. A simple mastoidectomy was performed, the tympanum was flushed with alcohol and salt solution, the sinus incised and the clot above and below turned out until free bleeding occurred. The sinus and mastoid wounds were packed with iodoform gauze and the upper half and posterior extension of the wound closed. In this case the gauze was allowed to remain four days, when it was removed and the wound inspected and packed again for twenty-four hours. Then the packing was removed and the clot inducted, the blood being obtained by means of a deep nick or cut with scissors in the lower end of the anterior wound flap. The lower half of the mastoid wound was then closed by means of adhesive strips, an outer dressing applied, and this changed daily. Six days later, or on the eleventh day following the operation, the ear was absolutely dry and the mastoid wound apparently sound, as the surface was healed. At this stage, however, the lower angle of the wound with that portion of the clot broke down, and after ten days finally healed with only a slight depression. In the meantime the ear remained dry.

This case is unique, and I regard it phenomenal, in that all operators who have employed the blood-clot dressing are agreed that in sinus, brain and meningeal complications the cases should be treated by the open method and packed. Moreover, this patient was alcoholic and syphilitic.

CASE 6.—S. H., woman, aged 28, admitted to the Polyclinic Hospital, July 30, and discharged, August 7, had a secondary radical mastoid operation. The posterior wound healed in five days, and the ear was dry in seventeen days.

CASE 7.—M. V., man, aged 26, admitted to the Polyclinic Hospital, August 2, and discharged, August 6, had a radical mastoid operation nineteen years previously, but the wound never healed. Moreover, there was a large opening the size of a dime behind the ear. A secondary radical operation, plus a plastic operation to close the postauricular opening, was performed and the mastoid wound cavity packed with iodoform gauze through the external meatus. The following day the iodoform gauze was removed and the clot inducted. The posterior wound healed in five days, when the patient left the hospital. One week later with the disintegration of the clot and the lack of its support, the posterior wound in this case broke at one point on account of the lack of vascularity of the scar tissue in the flaps from the first operation. Under local anesthesia the scar tissue was trimmed out and the margins of the flaps sutured. Healing occurred in five days but with slight depression.

CASE 8.—E. N., woman, aged 28, had a classic radical mastoid operation at the New York State Hospital, August 4. The wound cavity was packed with iodoform gauze, which was removed next day and the clot admitted. The wound healed by primary intention and the ear was dry in fifteen days.

CASE 9.—J. H., man, aged 26, was operated on at the New York State Hospital, Central Islip, L. I., August 15, secondary to a radical operation ten years before, which never healed or ceased to discharge. During the operation the sinus was injured and on this account the iodoform packing was left in for three days, when it was removed and the clot inducted. Primary healing of the wound occurred, and the ear was dry in twenty days.

42 West Seventy-Seventh Street.

Tuberculosis and War Risk Claims of Soldiers.—According to Col. Charles E. Banks, chief medical adviser of the War Risk Insurance Commission, approximately 50 per cent. of all claims for war risk compensation are based on tuberculosis. In about 50 per cent. of the soldiers discharged from the Army for disability, tuberculosis is the cause.

THE VALUE OF CHEST FLUOROSCOPY

F. E. DIEMER, M.D. (Hot Springs, Ark.)
Captain, M. C., U. S. Army
AND
R. D. MacRAE, M.D. (St. Maries, Idaho)
Lieutenant, M. C., U. S. Army
CAMP LEWIS, AMERICAN LAKE, WASH.

In the first draft quota (of about 50,000 men) inducted into the military service at Camp Lewis, the roentgen-ray staff of the base hospital made about 5,000 fluoroscopic chest examinations, with the cooperation of the president of the tuberculosis examining board. As our equipment and organization at that time were not adequate, we have no data to present covering this work.

April 1, 1918, we installed a fluoroscopic outfit at the mustering office for performing work there, in conjunction with the tuberculosis and the cardiovascular boards. It should be observed that the fluoroscopic examinations undertaken were intended not only to confirm the clinical diagnosis of tuberculosis but also for the recognition of abnormal chest conditions that might exist and be overlooked on physical examination. In the event that any abnormality was discovered on screen examination, the man was thereupon referred to specialists for reexamination. This proved of decided advantage to the president of the tuberculosis examining board on account of the fact that noise and haste do not improve the ability of the clinical examiners.

From April 1, 1918, to Aug. 10, 1918, we screened 13,893 chests. Our equipment consists of the special type 3-inch self-rectifying Coolidge tube actuated by the standard bedside unit. The Edwards screen is used and affords a very sharp, contrasty illumination. We have found that in order to get the maximal diagnostic assistance, first class equipment is essential. The tube must afford the smallest focal spot and the screen must be the most brilliant with no lag.

To achieve greater efficiency it was necessary to adopt a standardized nomenclature and routine. According to our routine, ten patients, stripped to the waist, are admitted simultaneously to the fluoroscopic room. After completion of each examination a blue light, suspended over the fluoroscope, behind the operator, controlled by the stenographer who records the findings, is turned on to permit rapid change of patients and to facilitate the penciling of areas on the chest requiring reexamination or reference to the cardiovascular board.

The stenographer at the mustering office makes two typewritten copies of each dictation, with the name of the operator on each, one for filing with the tuberculosis examining board, the other for the roentgen-ray department. The findings are also tabulated in a ledger to check the work of each operator.

The amount of fluoroscopic work that can be properly done by one operator is limited. An efficient fluoroscopist should average sixty examinations an hour. Experience has shown, however, that to avoid undue fatigue he should confine himself to a maximum of two hours, the best procedure being to divide the work into two periods of an hour each, one in the morning and one in the afternoon.

The draft quotas have arrived at Camp Lewis at the rate of about 10,000 a month, and have been examined, for the most part, during the first ten days, averaging 1,000 recruits a day. Of these about 250 have been eligible for screening. Our staff has been obliged to work at top speed averaging ten days a month. During the subsequent twenty days the daily fluoroscopic examinations have been from forty to sixty, including late arrivals, reexaminations of suspicious cases, and chest fluoroscopies of all pneumonia, influenza and measles patients.

WHEN FLUOROSCOPY SHOULD BE UNDERTAKEN

Our experience has demonstrated that practically 25 per cent. of all men between the ages of 21 and 31 should be subjected to thorough examination for the detection of possible chest abnormalities. Such examination should be undertaken in cases presenting any of the following points, which have been formulated by the president of the tuberculosis examining board:

A. History of prolonged contact with, or death in the family from, tuberculosis.

B. Inability to work because of ill health.

C. Well defined history of previous pleurisy, pneumonia, frequent or protracted colds, typhoid fever, or any other past illness of prolonged duration which might have constituted (or indicated) tuberculosis, such as prolonged cough accompanied by expectoration, hemorrhage from the lungs or expectoration of bloody sputum, loss of weight or strength, fatigue, night sweats, etc.

D. Existing cervical adenitis, tuberculosis of the bones or joints, or rectal fistula.

E. Every asthenic case and all cases in which the physical condition is manifestly below par, or giving evidence of lack in stamina or resistance.

F. All cases of chest deformity, scoliosis, kyphosis, funnel chest, barrel chest and flat or pigeon breast.

G. All cases in which physical examination reveals:

1. Impaired resonance on percussion.
2. Increased transmission of voice sounds, over areas in which these are not normally increased.
3. Abnormal breathing, such as sharpened vesicular or rough inspiration, over areas in which this is physiologically abnormal, even though no râles are detected.
4. Râles.
5. Fixation of the lung border.

RECOGNITION OF TUBERCULOSIS

Out of a total representation of 13,893 chest fluoroscopies, 425 patients were rejected on account of pulmonary tuberculosis. We are unable to claim recognition of all these cases, but a considerable percentage have likewise failed to be recognized by the clinical examiners of the tuberculosis board, including a number of unmistakable cases which have been detected by the screen. The very thorough performance of this system is evidenced by the fact that a very few cases of tuberculosis, overlooked in our mustering office work, have been admitted as such to the base hospital after being mustered.

We are not only convinced that, with careful examination, very few cases of tuberculosis will pass the roentgenologist unrecognized, either as such or presenting definite abnormalities that prompt him to send the subject to the special examiners, but also know that fewer cases will thus be overlooked than by clinical examination, particularly when the clinician is unable to eliminate haste and noise. The physical signs in the case of chronic and inactive fibrocaseous tuberculosis are minimal and susceptible of recognition only by the experienced clinician, but the screen findings offer

unmistakable evidences of the abnormality in question.

We have been very careful not to diagnose tuberculosis unless the roentgenologic evidence is unmistakable. The argument appears to be current among clinicians that screen findings do not offer incontrovertible evidence of a tuberculous condition, and that a positive diagnosis of tuberculosis in the absence of excavation is impossible. We are of the opinion that this view arises from the lack of familiarity with the technic of chest fluoroscopy or because of an inferior tube and screen. The finding in certain types of pneumonia present almost, although not the same, picture.

The percentage of unmistakable cases of tuberculosis overlooked by the clinicians and detected fluoroscopically is difficult to estimate accurately, since a great many histories mention only slight impairment, râles that are not constant, diminished breath sounds, slightly increased resonance, and fixed diaphragm and other physical signs, which, while they may be associated with tuberculosis, are not necessarily symptomatic of such process. In such cases, in the absence of definite notation of a tuberculous process or of its location and other relevant data, we have been inclined to give the clinicians due credit. Such conditions, in the event of the tuberculous process being inadequately described, or slightly doubtful and not susceptible of verification by the fluoroscopist owing to the lack of time and other factors, we have classed as suspected or as extremely suspicious, depending on the degree of abnormality accurately described by the fluoroscopist. Our screen findings in connection with 425 cases of rejection on which our discussion rests we have thus tabulated:

Unmistakable pulmonary tuberculosis—clinical verification unnecessary—248 cases, or 58.3 per cent. Extremely suspicious of pulmonary tuberculosis—clinical verification necessary—89 cases, or 20.9 per cent. Suspicious—clinical verification necessary—31 cases, or 7.2 per cent. Abnormalities in illumination, haziness (general or localized) combined with diaphragmatic limitation, adhesions, marked calcification areas, etc.—clinical verification essential and necessary—32 cases, or 7.5 per cent. Unrecognized by the fluoroscopist (no abnormality whatever noted), 13 cases, or 3.06 per cent. As regards our cooperation with the clinicians in connection with chest examinations, the following supplementary comments may be made: A great many subjects may be returned for special clinical reexamination even when the screen has detected only vague abnormal shadows, such as slightly reduced apical illumination or increased visibility of the secondary bronchi. Special attention is directed not only to the different degrees of illumination but also to the position of the diaphragm, heart and trachea, in connection with the various degrees of scoliosis, with a view of enabling the clinician better to account for the increased vocal fremitus, bronchial breathing, etc., associated with those cases.

ADVANTAGES OF FLUOROSCOPY

We come to the consideration of the relative advantages of fluoroscopy and the reason the highly important character of its rôle in chest examination should receive more widespread recognition than heretofore. By the way of preface it may be observed, once for all, that this report is submitted as a plea for a more thoroughgoing use of the fluoroscope in wholesale chest examinations.

In determining the chronicity of a given lesion, observation of the diaphragmatic excursions and separation is a factor of the first importance. The greater the area of parenchyma destroyed by the tuberculous process, the greater is the degree of lagging presented by the corresponding portion of the diaphragm in deep inspiration. The same holds true of the intercostal separation. It is difficult to ascertain even with the use of stereoscopic plates the exact location of a pleurodiaphragmatic adhesion. Furthermore, as many subjects are apparently unable to inspire deeply, a plate does not show the diaphragm well separated, whereas a definite idea of the excursion and separation is obtained by directing the patient to cough violently behind the fluoroscopic screen.

The extent of pleuropericardial adhesions can be determined more definitely by the screen method, as the heart excursion on deep inspiration can be estimated. Encapsulated pleural effusion can be localized about as readily by fluoroscopy as by stereoscopic plates, as the oblique view is obtainable and as the nearer the shadow is to the tube the larger it appears; and vice versa, if the shadow in question is larger when the patient is facing the operator than when turned around, the shadow is posteriorly situated. An oblique view determines its proximity to the chest wall. Also if fluid is not tightly encapsulated or is free on the pleural cavity, its upper level maintains a parallel plane with the floor when the patient flexes his body to the right or the left. This is also obviously true of lung abscesses and excavations that contain fluid.

We have on several occasions been at a loss to differentiate a uniform interlobar thickened pleura from a localized pleural effusion, and determined the exact condition only after both screening and roentgenography. Excavations that do not contain fluid almost always "light up" on coughing and are thus differentiated from circular pleuritic adhesions. Retraction or displacement of the heart, mediastinal contents and trachea (if only slight) are more definitely recognized by fluoroscopy, because not even the most carefully trained manipulator will uniformly secure the correct relation between the patient and plate; and if the tube is centered ever so slightly to either side of the midvertebral line, the distortion is very marked. In making many plates daily this will happen frequently. Also the patient may assume a scoliotic position with consequent lessened degree of illumination of the corresponding apex.

The posterior mediastinum is readily viewed by turning the patient obliquely and should invariably be done. Dilatation of the aorta, posteriorly, is not even recognized by stereoscopic plates. The screen is particularly to be preferred to plates in cardiovascular examinations. Orthodiaphragms, accurately made, show the exact cardiac area with no distortion or exaggeration whatever. We have discovered several cases of marked dilatation of the aorta that showed very few clinical signs; three cases in particular showed no evidence of abnormality except tracheal tug and accentuation of the second aortic sound on careful clinical reexamination.

It is very important to observe the degree of illumination of the apexes, the diaphragm being cut down to a horizontal rectangular slit and both viewed at once, the patient's head being directed forward with the back to the operator and the screen. The slightest difference in the degree of illumination should be carefully noted,

it being remembered that slight increase in blood or fibrous tissue causes considerable haziness of the apex. Occasionally a brilliant illumination of a tuberculous apex will be seen, the result of compensatory emphysema. This phenomenon accompanies old fibrous processes, particularly those centrally located, the surrounding air sacs becoming dilated. Scoliosis from contracture of the chest wall will decrease the degree of illumination.

ABNORMALITIES DETECTED

There were in the whole series five cases of unmistakable bronchiectasis detected by the screen and verified by the plate and the clinician. The characteristics are as follows: There is a marked increase in density along the course of the secondary bronchi, the result of fibrous tissue changes. The dilated spaces in the bronchi vary greatly in size and shape and are observed as clear areas, rather circumscribed as to outline, either cylindric, oval, fusiform or presenting a sacculated appearance, resembling a bunch of small grapes, depending on the size of the secondary bronchi involved and the degree of obstruction.

One contingent of stockmen from an alkali district presented a very marked increase in visibility of the bronchovesicular tree, the result of dust deposit. We returned a large percentage of these men for reexamination by the special clinical examiners, and the clinical symptoms were particularly negative. Pneumonoconiosis is readily recognized as an abnormality but is differentiated from the chronic bronchitis and peribronchial tuberculosis only by plates and clinical study. Of the 425 cases, eight presented a unilateral pleural effusion. The condition was very chronic, and without exception the patient was unaware of the condition. We have studied four cases of spontaneous pneumothorax. We have found that about one man in 3,000 has a complete visceral transposition. We have in every case determined the stomach transposition by giving barium or observing the location of the gas bubble. In one case, pleuropericardial adhesions had rotated the apex forward and to the right, presenting clinically a cardia dextra; but the true condition was readily determined by the screen. Forty-one cases showed retraction of heart or trachea, which was very marked. Retraction was not always mentioned if the case was unmistakable, on account of necessity for haste.

In our work at the base hospital, we have detected one case of undoubted metastatic sarcoma of the lungs, presenting diffuse lymphatic distribution in contradistinction to circumscribed changes in the lung parenchyma. In our series of 18,893 examinations, many postpneumonic abnormalities were detected. These consisted of pleural thickening, interlobar adhesions (found for the most part on the right side and evidently anteriorly between the upper and middle lobe), pleurodiaphragmatic and pleuropericardial adhesions, organized encapsulated pleural effusions, and mediastinal retractions and displacements, the result of adhesions. Also, many cases were referred to the cardiovascular board on account of abnormality in configuration of the heart and mediastinal silhouettes. Two identical cases of diaphragmatic hernia were found, in which a much dilated diverticulum of the splenic flexure was present in the chest cavity. Extreme atelectasis was present with clinical findings that varied, depending on the quantity of gas in the diverticulum and consequent pressure on the lung. The condition in each case followed injury to the diaphragm, the result of rib resection.

CONCLUSION

We wish again to recall that fluoroscopy should not be considered an adjunct in chest diagnosis, but should primarily be used to detect chest abnormalities, especially in wholesale examinations when the clinicians are compelled to devote only a few minutes to each subject.

PNEUMOBACILLI AS COMPLICATING ORGANISMS IN INFLUENZAL PNEUMONIA *

H. J. NICHOLS, M.D.
Lieutenant-Colonel, M. C., U. S. Army
AND
C. O. STIMMEL
Captain, S. C., U. S. Army
WASHINGTON, D. C.

The bacteriology of the pneumonia of the recent epidemic has dealt, principally, with influenza bacilli, pneumococci and hemolytic streptococci, but several other organisms have also probably played a part in producing the complicated lung lesions. In this note, we wish to call attention to the *B. mucosus-capsulatus* group. The importance of recognizing these organisms is twofold: (1) In some cases they have a pathologic significance; (2) in many other cases they are probably harmless or terminal invaders; but in smears and sections, they may be mistaken for influenza bacilli.

No final answer has apparently yet been given to the problem of correlating the unusual lung lesions of this epidemic with the bacteriologic findings. Without entering into a full discussion of the subject, we may say that our experience, which includes cultures from lung punctures made during life, has led us to adopt the following working hypothesis: Influenza bacilli, so called at least, are the primary cause of the bronchiolitis and hemorrhagic pneumonia. In uncomplicated cases, the patient recovers or dies without any other specific lesion. But uncomplicated cases are rare, and secondary invasion usually occurs by pneumococci, streptococci or other organisms that may happen to be in the nose or mouth. These organisms produce their specific tissue reactions which, however, are not always typical on account of the underlying influenzal lesions. Pneumobacilli produce a patchy consolidation which, by coalescence, resembles that of lobar pneumonia.

Our attention was first directed to the *B. mucosus-capsulatus* group by the findings in a patient who died early in the epidemic. The case was a typical one of pneumonia following influenza. The lungs showed a diffuse hemorrhagic pneumonia with patches of consolidation, especially in the lower part of the left lower lobe. Cultures from the lung and heart's blood gave only the Friedländer type of organisms. Sections showed a large number of gram-negative bacilli in the alveoli. Sections of the hemorrhagic areas were typical of the congestion, hemorrhage and edema of the epidemic; sections of

* From the Laboratory Service of the Walter Reed General Hospital.

the consolidated areas showed the alveoli filled with desquamated epithelium and leukocytes of the mononuclear type.

A series of inoculations was then made from consecutive necropsies of 1 to 2 c.c. of lung juice, subcutaneously and intraperitoneally, in guinea-pigs. Twenty-seven out of thirty animals died in from twenty-four to forty-eight hours with an infection of the Friendländer type. The same group of organisms was found in smears and cultures of the lung juice, along with pneumococci, streptococci and staphylococci, often in very large numbers.

The organisms of this group are known to be frequent inhabitants of the nose, and in a series of fourteen postmortem sinus examinations, they were found seven times, most frequently in the sphenoid sinuses.

These findings have led us to regard, with some qualifications, the significance of cultures of the lung after death, as many organisms can apparently invade very quickly. Cultures of material obtained by lung puncture, made during life, have more significance. In a series of ten such cultures, we have found the influenza bacillus seven times, pure in five cases and combined with pneumococci, Types II and II irregular, in two cases; in one case, pneumococcus Type I was found alone. Two cultures were sterile.

Out of ten guinea-pigs inoculated with material from ten other lung punctures, made during life, one died of Friedländer infection.

We have spoken of these organisms as a group, as subdivisions by sugar reactions do not seem entirely reliable. Reactions in nine strains were as shown in the accompanying table.

SUGAR REACTIONS OF B. MUCOSUS-CAPSULATUS GROUP, WITH HISS SERUM WATER

No.	Fermentation Tubes			Mannite	Maltose	Dextrin	Inulin	Salicin	Litmus Milk
	Glucose	Lactose	Saccharose						
1	+ 40%	+ 40%	+ 5%	+	+	+	0	+	+
2	+ 30	+ 20	+ 10	+	+	+	0	+	+
3	+ 50	+ 10	+ 100	+	+	+	0	+	+
4	+ 20	+ 20	+ 40	+	+	+	0	+	+
5	+ 40	+ 40	+ 0	+	+	+	0	+	+
6	+ 30	+ 40	+ 0	+	+	+	0	+	+
7	+ 30	+ 40	+ 0	+	+	+	0	+	+
8	+ 40	+ 40	+ 0	+	+	+	0	+	+
9	+ 20	+ 20	+ 0	+	+	+	0	+	+

These organisms are gram-negative, nonmotile bacilli which appear very small and fine except when their capsules are stained. They grow very rapidly on ordinary mediums and produce a mucoid, sticky growth.

Whether there is a characteristic, pathologic lesion produced by this group, which can be distinguished from a pneumococcus lesion, can be decided only by more complete study of our material.

The second point we wish to make is that these organisms should not be mistaken for influenza bacilli. If the findings in smears and sections are checked by cultures, preferably on plain agar, there is little chance of error; but if smears, for example, of sputum or washings of peritoneal exudate of a mouse, are examined only by microscope, mistakes might easily occur. The organisms of this group are much smaller and finer than one might suppose from the character of the growth, and they resemble the influenza bacillus quite closely in most preparations. The same is true of sections.

EPIDIDYMITIS AS A COMPLICATION OF MENINGITIS

A STUDY OF TWENTY-FOUR CASES *

JOSEPH R. LATHAM, M.D. (BELHAVEN, N. C.)
First Lieutenant, M. C., U. S. Army
CAMP JACKSON, COLUMBIA, S. C.

As a feature of meningococcus sepsis, epididymitis has heretofore been little noted. At Camp Jackson, however, during the epidemics of the past year, it has assumed decidedly an important place in the list of complications of meningitis. In one series of 290 cases, it occurred in more than 3 per cent. During a sporadic outbreak occurring during October, 1918, it has been much more frequent. In this series of thirty-six cases, more than a third of the patients developed epididymitis as a complication during their convalescence. So frequently has it occurred, and so typical is its onset and its course, that it is with us beginning to assume almost the dignity of a symptom rather than of a complication.

So far as we have been able to determine clinically, it is an epididymitis without definite orchitic involvement. Certainly if the latter occurs at all, it is only slight and transient. The picture is that of a hard, sharply demarcated epididymis, with the globus major as the primary focus in practically all of the cases. The process quickly extends to the body of the epididymis. The tunica vaginalis testis usually contains a little fluid, its presence being proved by transillumination.

The cause of the complication is still in doubt. Our cases of meningitis are all in men between 20 and 30; that is, at the age of greatest sexual activity. All are treated by massive intravenous doses of antimeningococcus serum. Inquiries, however, in regard to its incidence in cases of pneumonia treated by serum in virtually the same way, are negative; it does not occur. The nature of the lesion; its localization in the epididymis, would certainly point toward its being septicemic in its origin. Our records show as a matter of fact that 70 per cent. of the cases had a positive blood culture; 20 per cent. showed a negative blood as well as a negative spinal fluid. The other 10 per cent. showed the meningococcus present in the spine; that is, the organism had reached the stage of localization and was no longer a systemic invader.

From these statistics one would expect that the onset of an epididymitis would be a danger signal. As a matter of fact, it is not. There has been no case of relapse following this complication. Furthermore, there is no relation between the severity of the clinical features of meningitis or of sepsis, and the occurrence of epididymitis as a complication. Some of the mildest cases of meningitis show most marked epididymal involvement.

Apparently venereal diseases are not factors in the causation of this complication. Venereal history was elicited in 32 per cent. of the cases. Certainly none of this series of twenty-four had active gonorrhea. It seems, in passing, reasonable to assume that the meningococcus, being so close a relative to the diplococcus of Neisser, may have also a localizing affinity for the epididymis.

* From the Medical Service of the Base Hospital.

The accompanying table outlines cases taken at random from our series. As will be noted, every case in which the meningococcus was found and typed showed a Type IV meningococcus. Although we have had several cases of parameningococcus infection in our series, none of them have shown epididymitis as a complication. It is interesting to note that the Type IV meningococcus is biologically and culturally the nearest relative to the gonococcus.

The morbid anatomy of the condition is not known. No case in which it occurred has gone to necropsy. Neither has any case shown any evidences of pus formation. Puncture smears taken in four cases failed to show the presence of meningococcus. Cultures made at the same time remained sterile.

The lesion begins as a discrete, brawny induration of the globus major of the epididymis. Usually the involvement is unilateral. In 10 per cent. of our cases, it was bilateral. The inflammation very quickly extends to include the whole epididymis. There is some heat and redness, which quickly subsides. In the majority of cases there is a small hydrocele, which serves to make one think that the testicle itself is larger than normal.

The epididymis is quite tender to palpation, the upper pole being the seat of great tenderness. The testicular body is not particularly tender. There is practically no febrile rise associated with its onset; if it occurs, it lasts only a few hours and is very slight.

There is very little pain associated with the complication. As long as the patient remains still, he is comfortable. When he moves, he usually does so very gingerly. After the second day, or at most, after three days, even this slight discomfort disappears, and convalescence progresses apparently without halt.

The diagnosis is usually self evident. The very marked increase in size of one or both testicles, associated with so little pain and febrile reaction, is a very striking feature. There is none of the exquisite tenderness and pain of a mumps orchitis. Probably this is due to absence of any distinct testicular involvement. The lack of constitutional disturbance may readily cause the complication to be overlooked, especially if the patient is toxic, or the swelling and induration slight.

Its differential diagnosis has largely been given above. A few cardinal points present themselves:

1. The striking preference which the complication shows for the epididymis and especially the globus major.
2. The absence of any demonstrable venereal infection.
3. The slight pain and discomfort, and the absence of constitutional disturbance.
4. Its occurrence during the course of a meningococcus infection and especially during convalescence.
5. The lack of atrophy and the gradual return to normal of the testicle and epididymis involved, this differing most decidedly from other conditions such as mumps and the chronic infections of syphilis and tuberculosis.

OBSERVATIONS IN TEN CASES

Patient	Fever During Complication	Laboratory Data			Clinical Features on Which Diagnosis Was Made	Part Affected	Result
		Blood Culture	Spinal Fluid	White Blood Cells			
1	None	Type IV meningococcus	Type IV meningococcus	21,700	Stiff neck; hyperesthesia; Kernig; Brudzinski; fading rash	Globus major principally; both epididymides	Rapid subsidence of inflammation; no atrophy
2	None	Negative	Type IV meningococcus	.....	Back and neck stiffness extreme; Kernig; Brudzinski very pronounced	Right epididymis....	Rapid subsidence of inflammation; globus major remained hard and discrete
3	None	No organisms	No organisms	23,200	Delirium; hyperesthesia; petechiae; stiff neck; Kernig	Both epididymides	Complete subsidence; no enlargement of epididymis remaining; no atrophy
4	None	Type IV meningococcus	Type IV meningococcus	35,400	Marked headache; marked neck stiffness; Kernig	Right epididymis; globus minor most involved	Globus minor remained hard and discrete; not tender; no atrophy
5	100.2 F., one day	.....	Meningococcus, not typed	21,400	Macular and petechial rashes; delirium; extreme neck stiffness; Kernig	Both epididymides on left side; globus minor most involved	Inflammation subsiding; still a little tender to palpation
6	None	Meningococcus, not typed	Type IV meningococcus	.....	Petechiopurpuric rash; stiff neck; Kernig; leg Brudzinski; external rectus palsy	Right epididymis....	No remaining inflammation; stil slight enlargement of epididymis
7	99.6 F., one day	Type IV meningococcus	Type IV meningococcus	31,000	Petechiae; delirium and hyperesthesia; neck stiffness; Kernig; leg Brudzinski	Right epididymis....	Rapid subsidence; no remaining enlargement
8	None	Meningococcus, not typed	No organisms	37,800	Delirium; stiff neck; Kernig; Brudzinski; ill balanced reflexes	Right epididymis....	Globus major remained hard; discrete but not tender; no signs of atrophy
9	None	No organisms	No organisms	28,000	General hyperesthesia; chill, fever, vomiting; petechial rash	Right epididymis....	Rapid return to normal; no atrophy
10	99.6 F., followed by two days' fever	No organisms	Type IV meningococcus	16,400	Profuse petechial rash; general hyperesthesia; stiff neck; Kernig	Left epididymis.....	Rapid return to normal; no atrophy

A routine study of the urine in these cases fails to show any evidence of concurrent renal or bladder involvement. This is not to be wondered at, since the meningococcus very rarely shows a localizing affinity for the renal parenchyma. Blood counts taken at the crest of the epididymal inflammation showed a moderate leukocytosis. This finding is of course subject to question because of the well known high leukocyte count of uncomplicated meningitis.

Prognosis in these cases is very good. As stated above, there has been no case of death in the entire series. In those cases under observation there has been no evidence of testicular atrophy. The epididymis manifests a slow but progressive tendency to return to its normal size and consistency. In the cases observed, this change covered a period of from six weeks to three months. The globus major may remain slightly enlarged for an indefinite period. Its occurrence means nothing as a warning of relapse. Blood

cultures taken during the acute stage are uniformly negative.

Treatment consists principally in leaving the patient alone. He is ordered to remain on his back and encouraged to drink plenty of water, and his emunctories are kept working at capacity. If the dragging pain is an annoying feature, the use of a towel spread between the legs or of a small pillow placed so as to support the scrotum will be found sufficient. The patient as a rule discards a suspensory very promptly if one is given him. Aside from these foregoing measures, nothing is done.

SUMMARY OF FEATURES

Attention may be called to:

1. The lack of relation between occurrence of epididymitis as a complication, and the severity of the meningococcus infection.
2. The lack of relation between the physical signs and the objective and subjective symptoms.
3. The absence of any associated orchitis.
4. The uniformity with which the complication attacks the epididymis, especially the globus major of the epididymis.
5. The comparatively quick return to normal and the absence of any tendency to atrophy, either primary or secondary.

EXPERIMENTAL MEASLES

A REVIEW *

LUDVIG HEKTOEN, M.D.
CHICAGO

In view of the increasing interest in the study of measles and its complications, it may be of advantage to survey briefly the results of the efforts to produce measles experimentally. The experiments in question fall in two groups, those on human beings and those on animals, especially monkeys.

EXPERIMENTAL MEASLES IN MAN

So far as known, the first attempt to inoculate man with measles was made by Francis Home in Edinburgh in 1758. The suggestions probably came from Alexander Monroe the Second, and the purpose was not to study the nature and seat of the virus but to insure the disease "in a gentle and favorable degree" in the hope that many might "be preserved from that malignant sort which often proves mortal, and is always dangerous." Home[1] ordered a very superficial incision to be made "amongst the thickest of the measles, and the blood which came slowly away was received on some cotton." He then made an incision in each arm of the person to be inoculated, let the wounds "bleed for a quarter of an hour before the cotton was put in, that the fresh blood might not wash off, or too much dilute the morbillious matter." The cotton remained three days in the wounds.

Home inoculated fifteen children and concluded that in most instances measles developed in mild and modified form. However, there are good grounds to doubt Home's conclusion: His records show that in no case was the time between the inoculation and the supposed measles rash, which is not described in detail, more than ten days; his Case 10, which he describes as a typical measles from inoculation, "took measles again" a few weeks later; and in the event any of the fifteen children did have measles as claimed by Home, nothing is said as to what steps if any he took to exclude spontaneous infection.[2]

Besides Home, Wachsel,[3] Speranza,[4], von Katona,[5] McGirr,[6] Bufalini[7] and others[2] claim that they have inoculated human beings with measles; but in many cases the nature of the resulting disease, sometimes very mild, is not clear, and in practically all the possibility of natural infection does not seem to have been excluded.

Although Mayr[8] has given but few details about his experiments, his results seem to be accepted as trustworthy. He produced measles in six instances by the introduction into the skin of the material obtained from scratching the center of a rubeolous spot; and on placing fresh nasal secretion of early measles on the nasal mucosa, measles appeared in regular time in two of three experiments, the eruption coming out on the fourteenth day. In these cases the disease was typical though mild, and the patients are said to have remained free from subsequent attacks.

In my own experiments,[2] very special care was taken to exclude natural infection. In the first experiment, 3 c.c. of blood from a measles patient on the first day of the rash were mixed with 50 c.c. of ascites broth, and after an incubation of twenty-four hours at 37 C., 4 c.c. of this mixture were injected subcutaneously. In the second experiment, 2.5 c.c. of blood from a measles patient, taken about thirty hours after the first appearance of the rash, were mixed with 75 c.c. of ascites broth, and after an incubation of twenty-four hours at 37 C., 5 c.c. of this mixture were injected subcutaneously. In both cases the inoculated broth remained perfectly sterile, the cultures being kept under aerobic conditions. In the first experiment the temperature rose on the thirteenth day, and on the next day a typical measles rash appeared. In this case there were no respiratory symptoms at all. In the second experiment the temperature went up on the eleventh day, a mild conjunctivitis developed with a little cough and redness with increased secretion in the throat, and on the fourteenth day a typical rash came out. There was prompt recovery in both cases.

These experiments have been accepted as showing that the virus of measles is present in the blood in measles sometime at least during the first thirty hours of the rash. It is true that a doubt has been raised[9] as to the first case because there were no catarrhal symptoms; the rash was typical, however, and it is believed that naturally measles may occur without such symptoms (morbilli sine catarrho).

The most recent effort to immunize against measles by inducing a mild form of infection is that by Herrman.[10] In forty infants less than 5 months of age he gently rubbed the nasal mucous membrane with swabs

*From the John McCormick Institute for Infectious Diseases.

1. Home, Francis: Medical Facts and Experiments, 1759.

2. For more details in regard to Home's experiment, contemporary discussion about them, and other early indecisive experiments, see Hektoen, Ludvig: Experimental Measles, J. Infect. Dis. **2**: 238, 1905.

3. Wachsel, William: On Cutaneous Diseases **1**: 106, 1809.

4. Speranza, C.: Storia del morbillo epidemico della provincia di Mantova nell' anno 1882, Parma, 1824.

5. Von Katona, M.: Nachricht von einer im Grossen erfolgreich vorgenommenen Impfung der Masern, während einer epidemischen Verbreitung derselben, Oesterreichische med. Wchnschr., 1842, p. 697.

6. McGirr, J. E.: Inoculation in Rubeola, Northwestern M. & S. J. **7**: 434, 1850-1851.

7. Bufalini, B.: Rev. Sc. d. R. acad. die Fisiscritici **1**: 111, 1869; Die Masernepidemie zu Siena vom Januar bis Mitte Juni, 1869, J. f. Kinderkr. **56**: 282, 1871.

8. Mayr, F.: Beobachtungen über Masern, Ztschr. d. k. k. Gesellsch. d. Aerzte zu Wien **1**: 6, 1852.

9. Ustvedt: Norsk Mag. f. Lægevidensk. **67**: 128, 1906.

10. Herrman, C.: Immunization Against Measles, Arch. Pediat. **32**: 503, 1915.

on which had been collected the nasal mucus of measles patients twenty-four hours before eruption; fifteen gave a rise of temperature between the eighth and fourteenth days, and in a few instances a small number of indistinct spots were noted on the face and body between the fourteenth and eighteenth days. When more than a year old, four of these children came in intimate contact with patients with measles without becoming sick, and at the ages of 21 and 23 months two others were reinoculated without producing measles. The experiment is perhaps not to be regarded as completed because proof of immunity is not yet established.

Instances of apparent accidental inoculation of measles seem to be very rare. The case described by Michael[11] of supposed accidental inoculation with involvement especially of the inoculated arm is of doubtful nature as it may have concerned a lymphangitis.

EXPERIMENTAL MEASLES IN ANIMALS

Older veterinary writers described what they thought was measles in domestic animals, especially sheep and swine; but it is now established that it concerned other diseases.[12]

In the case of the dog brought to the notice of Chisolm[13] as an instance of measles, there is no record of any rash.

An ingenious hypothesis that mice may be a source of measles has been advanced by King,[14] but we have no experimental evidence indicating that the virus can survive and increase in this animal.

Going over the efforts to inoculate animals with measles, we find that negative results are reported by Warschawsky,[15] who injected small pigs and rabbits with blood taken in the eruptive stage, and by Pomjalowsky,[16] who injected measles blood into guinea-pigs, rabbits and small pigs.

Behla[17] placed warm nasal mucus and saliva from measles patients on the nasal and oral mucous membrane of rabbits, guinea-pigs, cats, mice, dogs and lambs, but without any positive results except for rather indefinite catarrhal symptoms. He then made a similar inoculation in a pig, 6 weeks old, after first scratching the mucous membrane with a sharp needle; on the fourth day the animal became sick with running at the nose and eyes, and on the eighth day a rash began to appear which soon spread over the whole body, and which Behla regarded as a true measles rash, especially because in a few days scaling took place. During this eruptive period, so-called protozoal bodies were present in the blood and in the secretions of the eye, nose and throat. Two large hogs also became infected presumably, so Behla concluded, from contact with the inoculated pig.

Repeating Behla's experiments, Josias[18] rubbed measles secretions over the throat, nose and eyes of several young pigs, but without any effects. He suggests that Behla may have encountered an eruptive disease natural to swine.

Geissler's[12] experiments gave only negative results. He used white sheep, swine, goats, dogs and cats, which were inoculated in various ways: Throat and nose secretions from the initial and eruptive stages of measles were smeared while still warm on the eye, nose and throat of the animals; measles secretions diluted with salt solution were sprayed into the throat; in some cases nasal mucus and crusts were rubbed into small wounds in the ears; in one sheep, fresh scales were placed in a pocket in the skin; and scales were rubbed on fresh erosions. The only changes produced were local. In the animals inoculated in the nose and throat, catarrhal phenomena were observed, but no rash.

Jurgelunas[19] inoculated blood from patients in the eruptive stage of measles into suckling pigs and rabbits, but without effect.

The animals so far mentioned do not seem to be susceptible to measles; at any rate, no one has succeeded in reproducing measles in any of them except possibly Behla in the pig; but his claim to that effect is so far without any support. It now remains to review the experiments on monkeys.

Chavigny[20] describes what he regards as a typical attack of measles in a monkey (cyanocephalus from Zanzibar) 3¼ years old, whose keeper had measles. Eight days after the keeper fell sick the monkey developed oculonasal catarrh, a mild bronchitis, and some fever; six days later a typical measles eruption appeared on the face, and then on the trunk and limbs, becoming confluent, especially on the abdomen.[21] Recovery was gradual with a furfuraceous desquamation lasting a few days. Another monkey (cercopithecus) exposed in the same way remained well.

Apparently Josias[18] was the first to try to inoculate monkeys with measles. He took the catarrhal secretion in the early eruptive period, the first or second day, and rubbed it over the lining of the nose and throat, injecting in some cases also from 0.5 to 1 c.c. of measles blood subcutaneously. In five rhesus monkeys no reaction resulted, but in three monkeys ("sajou") an eruptive fever developed "having all the symptomatology and the duration of measles." In one case the reaction developed thirty-two days after the monkey was placed in a measles ward and twenty-seven days after swabbing the nasal and oropharyngeal membranes with measles secretion, the animal in the meantime remaining in the ward and hence being exposed to direct contact; the eruption, a lenticular, macular erythema of the face and limbs, lasted about five days, and there was a slight furfuraceous desquamation; the rectal temperature in this period ranged from 39.4 to 41 C. (102.9 to 105.8 F.), and there was a persistent diarrhea. In the other two monkeys ("sajou robustus") the reaction was less severe; in one it came on thirteen days after the introduction of measles secretion, and small, red, poorly defined spots appeared on the face, which faded in a day or two; in the other, which received measles blood also, fever, coryza, and erythema of the face, neck and

11. Michael, J.: Durch zufällige Inokulation entstandener Masernfall mit hervorragender Beteiligung des infizierten rechtenarmes, Monatschr. f. prakt. Dermat. **6**: 339, 1887.
12. The literature is reviewed by E. A. Geissler in a Bern dissertation: Klinisch-experimentelle Untersuchungen über die Uebertragbarkeit der Masern auf kleinere Haustiere, 1903.
13. Chisolm, J. J.: A Case of Measles, Followed by Deafness, in a Dog, Contracted from a Human Subject, Med. Rec. **35**: 126, 1889.
14. King, A. F. A.: Measles and Mice, Washington M. Ann. **9**: 49, 1910.
15. Warschawsky, W. M.: Zur Aetiologie und klinische Bakteriologie von Masern und deren Komplikationen, Dissertation, 1895.
16. Cited by Jurgelunas (Note 19).
17. Behla, R.: Ueber das Vorkommen von Masern bei Tieren, Centralbl. f. Bakteriol. **20**: 561, 1896.
18. Josias, A.: Recherches experimentales sur la transmissibilité de la rougeole, Tribune méd. **30**: 211, 1898; Transmissibilité de la rougeole de l'homme aux animaux, Bull. méd. **12**: 230, 1898.
19. Jurgelunas, A.: Zur Frage der experimentellen Masern, Centralbl. f. Bakteriol., I, O. **72**: 483, 1914.
20. Chavigny, P.: Un cas de rougeole chez un singe, Bull. méd. **12**: 334, 1898.
21. "Une éruption morbilleuse typique, débutant par la face, puis s'étendant au tronc et au membres, et très confluente, surtout sur l'abdomen."

abdomen developed. To Josias it seemed as if the rhesus monkey was refractory to measles, whereas the "sajou," and especially the "capucin" variety, was susceptible. A rhesus ("guenon macaque"), which lived in a measles ward for six months and played constantly with the children did not fall sick.

Grunbaum[22] injected a chimpanzee with measles blood and clothed it in a measles nightgown, without any effect. His record of an experiment on another chimpanzee is as follows:

May 22, clothed in nightgown from case of measles. No effect.

June 5, swab from case of measles applied to nose and throat. Temperature, 100.2 F.

June 7, coryza. Temperature, 99.6 F.

June 11, slight roseola. Temperature, 102 F.

June 15, rash gone. Temperature, 99.2 F.

It remains doubtful whether this animal was really infected with measles. Coryza is not uncommon in the chimpanzee, although here it seemed to have a causal relation to infection.

We come now to the most important work on measles in animals, namely, that by Anderson and Goldberger.[23] These investigators produced measles in the monkey (*Macacus rhesus, cynomolgus* and *sinicus*) by the injection of blood and of nose and throat secretions of measles patients. In the case of blood, several methods of injection were used, but intravenous injections (by the external saphenous vein) came to be preferred, the amount injected varying from 2 to 5 c.c. Fresh, defibrinated blood was used most, but positive results were obtained with serum as well as with the washed corpuscles. The best results were secured with blood drawn just before or during the twenty-four hours immediately after the appearance of rash; with blood drawn later the results were more uncertain, and by about seventy-two hours after the onset of the rash the infective power seemed wholly lost. Mixed buccal and nasal secretions, diluted with salt solution and injected subcutaneously, also proved infective, but not always, being most infective early in the attack. Experiments with scales did not succeed.

No doubt a limited range of infectivity of measles blood and secretions, coupled with a variable susceptibility in the monkey, will account for many of the failures to inoculate this animal with measles.

According to Anderson and Goldberger, monkeys, when successfully inoculated, after a variable period, usually from six to ten days, develop a moderate fever, lasting from four to five days, and frequently also a more or less well marked eruption, which begins on the third day or so of the fever. Sometimes respiratory symptoms—cough, coryza, etc.—also appear. The eruption usually comes out first on the chest and abdomen, later on the thighs, arms and face, and it may then be fading where first seen. The typical eruption consists of small, red, rose-tinted or coppery maculopapular spots, which may coalesce into larger patches; on fading, stained spots may remain and a branny scaling may take place. "Some of our animals have presented as typical a picture of measles as will be seen in a well-marked case of the disease in human beings" (Anderson and Goldberger). Monkeys that passed through febrile reactions of this general character did not react to second injections of virulent measles blood; and the blood of monkeys in the midst of a reaction (not necessarily associated with eruption) would transmit the disease to other monkeys. Indeed, Anderson and Goldberger in this way passed the virus in one case through six successive monkey groups and again through three, but without any appreciable change in its virulence. They were able also to transmit the disease by contact through confinement of well with infected monkeys in the same cage. Here may be mentioned also their results from especial tests of measles virus in blood: They found that the virus is filtrable, that is, the serum of measles blood diluted with salt solution and filtered through a Berkefeld candle (size not given) remained virulent; drying blood for twenty-five and one-half hours or freezing for twenty-five hours did not destroy the virus, and some infective powers seemed to be retained by blood kept at 15 C. for twenty-four hours; heating for fifteen minutes at 55 C. destroyed the virus. Anderson and Goldberger always found that infective measles blood, monkey or human, caused no recognizable growth in glucose broth in fermentation tubes.

The results of Anderson and Goldberger are confirmed by Nicolle and Conseil,[24] Hektoen and Eggers,[25] and Lucas and Prizer.[26] Nicolle and Conseil injected measles blood drawn twenty-four hours before the eruption into the peritoneal cavity of a bonnet monkey (*Macacus sinicus*). Nine days later the monkey developed a fever, which on the second and third days reached 40 C. and which continued for six days. No eruption was observed. In rhesus monkeys injected with citrated measles blood, Hektoen and Eggers observed in addition to mild febrile reactions, accompanied in one case with a sparse maculopapular rash, also a leukopenia, principally neutrophilic and corresponding in point of time to the leukopenia of human measles. Leukopenia occurred also in a monkey injected with the blood of another monkey taken at the time of its reaction to human measles blood. Monkeys injected with human blood from other sources than measles patients did not develop any such leukopenia.

In two monkeys injected with measles serum and measles serum and corpuscles, respectively, Lucas and Prizer observed not only a measles leukopenia, typical even in details, but also Koplik spots in considerable numbers on the tenth day. There was no characteristic skin eruption, only a transient erythema of the face and forehead. On the ninth day, blood from these animals was injected into two other monkeys, and in one Koplik spots appeared on the tenth day. They point out that the occurrence of the leukopenia and of Koplik spots leaves no doubt as to the successful transmission of the disease.

22. Grunbaum, A. S.: Some Preliminary Experiments on Enterica, Scarlet Fever, Measles in the Chimpanzee, Brit. M. J. **1**: 817, 1904.

23. Anderson, J. F., and Goldberger, Joseph: Experimental Measles in the Monkey, a Supplemental Note, Pub. Health Rep. **26**: 887, 1911; Experimental Measles in the Monkey, a Preliminary Note, ibid. **26**: 847, 1911; The Period of Infectivity of the Blood in Measles, J. A. M. A. **57**: 113 (July 8) 1911; An Experimental Demonstration of the Presence of the Virus of Measles in the Mixed Buccal and Nasal Secretions, ibid. **68**: 476 (Aug. 5) 1917; The Nature of the Virus of Measles, ibid. **57**: 971 (Sept. 16) 1911; The Infectivity of the Secretions and Desquamating Scales of Measles, ibid. **57**: 1612 (Nov. 11) 1911; Recent Advances in Our Knowledge of Measles, Am. J. Dis. Child. **4**: 20 (July) 1912; Experimental Measles, Prac. Philadelphia Path. Soc. **14**: 163, 1912.

24. Nicolle, C., and Conseil, E.: Reproduction expérimentale de la rougeole chez le bonnet chinois; virulence du sang des malades 24 hours avant le debut de l'eruption, Compt. rend. Acad. d. sc. **153**: 1522, 1911.

25. Hektoen, Ludvig, and Eggers, H. E.: Experimental Measles in the Monkey, with Special Reference to the Leukocytes, J. A. M. A. **57**: 1833 (Dec. 2) 1911.

26. Lucas, W. P., and Prizer, E. L.: An Experimental Study of Measles in Monkeys, J. Med. Res. **26**: 181, 1912. Lucas, W. P.: Review of Recent Work on Measles, Am. J. Dis. Child. **6**: 412 (Dec.) 1913; The Value of the Blood Picture in the Early Diagnosis of Measles, Especially in Relation to the Question of Isolation, ibid. **7**: 149 (Feb.) 1914.

Jurgelunas[19] injected measles blood subcutaneously and intravenously into monkeys; he brought monkeys in contact with measles patients, and he rubbed measles mucus on the healthy as well as scarified lining of the mouth and pharynx of monkeys; but all remained well exept one ("Pavian"), injected intravenously with 5 c.c. of defibrinated blood drawn the day before eruption. On the tenth day this animal was sick, the pharynx was red, and there were some small red spots on the face, abdomen and thighs, but there was no fever; death took place on the twelfth day, and the organs were found to be sterile. The eruption did not clearly resemble that of measles, and Jurgelunas regards this experiment as having given a doubtful result.

Marzinowsky[16] experimented without result on one rhesus monkey.[27]

SUMMARY

We may conclude from the results of human experiments that the cause of measles is present in the nasal secretions, scrapings of the skin (epithelial debris and blood), and the blood, during the earlier part of the eruptive stage. Attempts to produce by inoculation a mild, modified or localized form of measles have not yet given conclusive results.

The only animal proved susceptible to measles so far is the monkey, but the susceptibility is not marked and seems subject to variation. The disease in the monkey is mild and takes the form after an incubation of several days of a brief fever, with which may be associated more or less typical skin changes, respiratory symptoms, Koplik spots, and the characteristic measles leukopenia. The results in monkeys show that the cause of measles is present in the nasopharyngeal secretions and the blood at least twenty-four hours before the rash, as well as for a day or two afterward.

CHANCRE OF THE FINGERS

DOUGLASS W. MONTGOMERY, M.D.
AND
GEORGE D. CULVER, M.D.
SAN FRANCISCO

Physicians, especially gynecologists and obstetricians, are particularly liable to syphilitic infection of the fingers. Nurses, one would think, are in almost the same danger in their professional work; but in them we have seen fewer instances of this unfortunate accident. Case 1 is a typical and instructive instance:

CHANCRE OF THE FINGERS SIMULATING PARONYCHIA

CASE 1.—June 19, 1913, a professional nurse was referred to us for a continuance of her treatment. Toward the end of the previous February she acquired what appeared to be a pyogenic infection under the edge of the right thumb nail. Shortly afterward a similar infection showed itself under the free edge of the nail of the left index finger, presumably following a wound with a safety pin. Both nails were evulsed, May 7. In both, therefore, the suppurative process had lasted considerably more than two months. A characteristic papular eruption, and mucous patches in the mouth, appeared, May 26. When we first saw the patient, June 19, there was just an indication of a fading roseola of the palms.

No other mode of entrance of the syphilitic virus than by the fingers could be ascertained by either the physician in charge of the case or by the nurse herself. The paronychias were particularly slow in healing, and the syphilitic eruption appeared at a time corresponding to the appearance of the paronychias as primary sores. That there should be two paronychias, both of which were probably chancres, was interesting and rare.

A paronychia-like chancre is peculiarly difficult to recognize, as it does not in any way resemble an initial lesion. The nail and the nail fold completely obliterate all its characteristics. An obstinate, long enduring and exceedingly painful panaritium, occurring in a physician or nurse, should excite our suspicions, and should lead to repeated examinations for spirochetes. After five weeks the blood might be examined for the Wassermann reaction. An indolent bubo at the epitrochlea or in the axilla has a diagnostic value. Any suppurative lesion of the finger, however, might give rise to such a swelling.

CHANCRE ON THE WEB OF THE FINGERS

Any sore lasting longer than an ordinary infection and situated on the dorsal surface of the web between the thumb and the index finger, or on that between the index and the middle finger in a gynecologist or an obstetrician, should give rise to the gravest suspicion of its syphilitic nature. These two localities come against the entrance of the vagina during examinations, and the skin is put on the stretch, so that any wound accidentally there is apt to be opened to its utmost, allowing an easy entrance for the virus from syphilitic lesions of the vulva or vagina. Case 2 is an excellent example of this kind of accident:

CASE 2.—A physician, aged 47, consulted us, March 23, 1909, for a sore that had appeared on the back of the web between the left thumb and index finger four weeks previously. He said that it had appeared as a bleb. There was now present an ulcer with a gray floor and soft, heavily infiltrated, blue base. The patient noticed swelling of the lymphatic nodule in the left axilla four or five days after the appearance of the lesion. There was no swelling at any time of the epitrochlear lymphatic gland. Two weeks after the appearance of the sore, there manifested itself on the abdomen a bright, evenly distributed rash, like that of scarlatina, which vanished in a day or two. In still another week the patient suffered from chills and fever. The eruption for which he consulted us had appeared two weeks previously. There was present, when we saw him, a deep red papular syphilid with much infiltration, scattered over the trunk, and to a less extent on the limbs. The only lymphatic enlargements demonstrable were in the left axilla and in the groins. His temperature was 99 F. in the morning and from 100.5 to 101 in the evening, and was associated with chills without a distinct rigor. Two small faintly stained spirochetes were found in a smear from the initial lesion. None were found in smears from a papule on the arm.

In this history the time given for the appearance of the chancre was undoubtedly incorrect. It was too close to the appearance of the eruption.

One must not allow absence of enlargement of the epitrochlear lymphatic nodule to influence one unduly in arriving at a negative conclusion in chancre of the hand, as some of its lymphatic vessels pass through the nodules of the epitrochlear region, while others go direct by to the axilla. Therefore, if the chancre is in a district drained by vessels that pass directly to the axilla, the nodules at the elbow may not be swollen or indurated.

I do not know anything about the subsequent history of this case, and it dates back to the time previous

27. A. F. Hess (German Measles [Rubella]: An Experimental Study, Arch. Int. Med. **13**: 913 [June] 1914) inoculated a rhesus monkey intraperitoneally with 3.8 c.c. of blood from patients with rubella, but the results were negative.

to the introduction of arsphenamin and to the notable improvements in the treatment of early syphilis. Nevertheless, we now know that it would have been of inestimable advantage if the patient could have had treatment before the cutaneous eruption appeared.

CHANCRE OF THE FINGER

A chancre, no matter in what situation, usually ulcerates, but it does not do so necessarily, and Case 3 is an instance in which it constituted simply an extensive infiltration:

CASE 3.—Feb. 25, 1910, a physician consulted us for an eruption which he first had noticed about four weeks previously. The eruption was a characteristic papular syphilid, not itchy, and appeared to come out suddenly on the forehead, back and chest, and scatter down sparsely over the arms. There were a few thinned out areas in the hair of the scalp posteriorly, and there was a mucous patch on the right tonsil. Four days before the appearance of the eruption the patient had a characteristic, intense, occipital headache.

Before the previous Christmas, he had noticed a painless induration, without break of the surface, situated on the radial side of the second phalanx of the left index finger. This he cut open. There was adenopathy in the left axilla, but none of the left epitrochlea, and a very small one of the right, so that the marked lymphatic enlargement in the glands, receiving the drainage from the affected district, so valuable in hunting for the seat of extragenital chancre, was of very little aid here. The dusky induration appearing before the eruption admitted, however, of no doubt as to its being the primary lesion. There was still another peculiarity, which sometimes occurs in the primary sore, an extraordinarily long enduring dusky redness. This was noted as being still present, Aug. 2, 1912, twenty months after the inception of the chancre.

As regards the acquisition of the disease, the doctor had operated on syphilitic tonsils in a Japanese, the middle of the previous November, and, as before mentioned, the induration on the finger was noticed before Christmas.

If for no other reason than to keep one on the alert in diagnosis, the subject of the primary lesion of syphilis, as it occurs extragenitally, is well worth considering. This is especially true nowadays when the results of early treatment, necessarily dependent on early recognition, are so brilliant, and the consequences of failure to recognize this disease are now known even to the laity as being so portentous. The physician, therefore, in recognizing the true nature of the disease may make a brilliant hit, or in failing to do so may achieve a failure, which from its very nature as appertaining to an eminently chronic malady may continue a reproach during his entire life of practice.

The essential difficulty, however, of recognizing these lesions in these situations in their early stages is shown by the cases cited, for one instance occurred in a professional nurse working with a physician, and the other two were in physicians in active practice; yet in no case was the true nature of the disease suspected until the appearance of the eruption.

323 Geary Street.

War Training as a Postgraduate Course.—No postgraduate course can equal the actual benefits to the professional man, no clinic can complete a system of organization so thoroughly as the war training is going to show the way. It will teach a system of efficiency to the medical man that will be a great asset to him after returning to private life. This is surely worth the while. Incidentally, it will teach the people the significance of the medical profession and the rôle it fills in regard to health. It will teach the people, as the insurance companies already know, the benefit of a thorough physical examination in both health and disease, especially in health.—President's Address, Minnesota State Medical Society, 1918.

A PULSE RATE STANDARD FOR RECRUITS *

THOMAS ADDIS, M.D. (SAN FRANCISCO)
Captain, M. C., U. S. Army
CAMP LEWIS, AMERICAN LAKE, WASH.

During routine work on the cardiovascular board at Camp Lewis, many recruits were seen who complained of symptoms suggestive of circulatory disorder, although no indication of any cardiovascular defect was obtained by the methods of inspection, palpation, percussion or auscultation. In this group of cases a functional test might be expected to help in the determination of the existence and of the grade of true circulatory disability. The regulations as to the examinations of recruits provide such a test. It is based on the changes in pulse rate induced by alteration in the position of the body and by exercise. The pulse rate is taken with the subject standing. He is then directed to lie down and the rate is again counted; thereafter he hops 100 times on the left foot, and the pulse rate is counted immediately and two minutes after this exercise with the recruit in the recumbent position.

The impression, however, of those who had had most experience with this test was that no importance could safely be attached to the results obtained by it unless they showed an extreme degree of acceleration of the pulse rate on exercise and a marked delay in the return to the pre-exercise level. The great majority, therefore, of men with symptoms but without signs of circulatory disability were accepted for full military duty, though often with doubt and hesitation.

This state of uncertainty in regard to the interpretation of the results of the regulation exercise test was all the more to be regretted since Mackenzie, Lewis and others who have had a large experience in the classification of soldiers with predominantly subjective cardiac disorders have found the pulse rate reactions to the strain of physical exertion one of the most valuable of all the objective criterions that they used as aids in the disposition of such cases.

It seemed not unlikely that the difference between their opinion and ours might arise from our want of exact knowledge as to what was a normal and what an abnormal reaction to the strain of the test we used. It was with the object of obtaining this knowledge that the work here reported was begun.

METHOD USED IN DETERMINING THE LIMITS OF NORMAL VARIATION IN PULSE RATE

The limits of normal variation can be deduced from a sufficient number of observations on normal individuals by the application of statistical methods. The measure of variation here used is known as the "standard deviation." It is obtained by finding the square root of the mean of the squared deviations from the arithmetical mean of the observations. This method is the one most commonly used by statisticians and biologists for such a purpose as ours.

The usefulness of a normal standard obtained by this or any other method will largely depend on the extent to which the conditions in the group of normal individuals on whose reactions it is founded are comparable with the conditions surrounding the individuals to whom the standard is to be applied. The men

*From the Cardiovascular Board, Camp Lewis, Wash.

for whom the standard was needed were newly arrived recruits, and "normals" were accordingly chosen from this clas sof men. They were questioned in an indirect manner as to the absence or presence of dyspnea on moderate exertion, and those in whom this symptom was absent were chosen for observation. Though this is a crude method of selection, it at least excludes the recruits with cardiac symptoms for whom the standard was especially required. The tests were made in the men's barracks between 6 and 9 p. m.

A CRITICISM OF THE MANNER IN WHICH THE REGULATION EXERCISE TEST IS COMMONLY CARRIED OUT

It was obviously desirable that the exact technic of the regulation exercise test as used by local and cardiovascular boards should be followed in establishing the standard, not only because it is the authorized test and accordingly in general use, but also because of its convenience and simplicity. It requires no apparatus, no furniture beyond a table, is immediately applicable under all circumstances, is rapidly carried out, and gives a numerical value to the reaction to four changing degrees of strain. But before making any very extensive series of records, it was thought advisable to make a preliminary analysis on a relatively small number of observations. It was thought that some idea might thus be obtained as to how many normals would have to be examined in order to obtain a standard that would be of value in dealing with individual cases.

For this purpose a physiologic principle of very general application was employed as a measure of the adequacy of the data. Under the stimulus of a demand for increased work or output, the organs of the body respond with an increase in function beyond the degree of functional activity existing at the time the demand arises. With a constant stimulus the relative extent of this increase in function will depend on the level of activity of function at the time of application of the stimulus. If the stimulus comes at a time when the organ is already working near to its total capacity, the percentage of increase in function is less than that which would have been induced if the stimulus had been applied at a time when the organ was working at a subnormal level. If the heart is already beating rapidly when the regulation test is started, the percentage of increase over the initial rate will be less than if the stimulus of change of position and of hopping had fallen at a time when the heart was beating slowly. If, therefore, a series of observations on normal individuals is arranged in groups according to the lowest pulse rates, which are those taken in the recumbent position, and the average percentage increase over this basal rate of the counts made while standing, after hopping, and two minutes after hopping is found for each group and plotted as points on a chart in which the average recumbent pulse rates of the different groups is the abscissa, it will be found that the lines joining these points will form curves which fall as the resting pulse rate increases. If the number of observations is sufficiently large, factors tending to variability will neutralize one another and the curves will be smooth. If the data are insufficient, the lines joining these points will be irregular and angular in proportion to the inadequacy of the data.

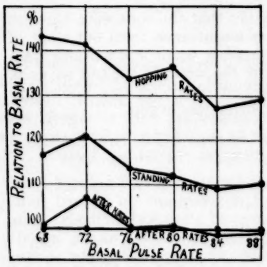

Chart 1.—Regulation exercise test: percentage relation of the pulse rates on standing, hopping and after to the lying rate; from observations on 214 normal recruits grouped according to the magnitude of the lying rate.

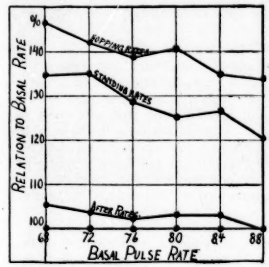

Chart 2.—Modified regulation exercise test: percentage relation of the pulse rates on standing, hopping and after to the lying rate; from observations on 214 normal recruits grouped according to the magnitude of the lying rate.

When 214 normal recruits had completed the regulation exercise test, their records were grouped according to the rates in the recumbent position, that is to say, all the men whose pulse rates while lying down were 72 were placed in one group, those whose lying down rates were 76 in another, and so on. This was the natural system of classification, since the pulse was counted over quarter minute intervals and all rates per minute were thus multiples of four. The rates obtained while standing, immediately afterward and two minutes after hopping were averaged in each group, and each average was expressed as a percentage of the rate in the recumbent position. These percentages for the groups between 68 and 88 are given in Table 1 and Chart 1. The number of cases in groups beyond this range was too small to be reliable.

It is apparent from Chart 1 that there is a considerable degree of irregularity in the curves, though there is a general tendency to a decrease in the percentage relationship as the pulse rate in the recumbent position increases. This irregularity is sufficiently marked to make it appear doubtful whether a standard obtained from normals who manifest such a degree of variability would have much practical value. The normal limits of variation might be so wide as to include all but cases with an extreme acceleration of pulse rate. Therefore, instead of continuing to amass records it seemed advisable to consider whether this variability might not have been exaggerated through

TABLE 1.—RESULTS OF THE REGULATION TEST ON NORMAL RECRUITS ARRANGED IN GROUPS ACCORDING TO THE LYING RATE

No. of Cases in Group	Average Pulse Rates per Minute				Percentage Relation to Lying Rate			
	Lying	Standing	Hopping	Afterward	Lying	Standing	Hopping	Afterward
11	68	79	97	69	100	117	143	101
16	72	87	102	77	100	121	141	107
26	76	86	102	76	100	114	134	100
39	80	90	109	81	100	112	136	101
37	84	92	107	83	100	109	127	99
27	88	97	113	87	100	110	129	99

some removable defect in the manner in which the test was applied.

When the test is judged as above in accordance with the degree of uniformity in the relationship of its different stages to one another, it is apparent that as commonly carried out the regulation test is defective. Any error in the estimation of the lying rate will lead to incorrect classifications and will tend to magnify the variability of the percentage increases produced by change of position and by hopping. It will be remembered that the lying rate is taken immediately after the recruit has changed from the standing to the recumbent position; but in this way the true lying rate is not obtained. It has been found that the rate of decrease in the pulse rate on the person's assuming the recumbent position is subject to considerable variation in different individuals. In some it occurs almost instantaneously, in others, and these comprise the majority, the fall takes place gradually. In most cases, therefore, the lying rate actually recorded represents some stage or other in the descent of the pulse rate from the standing to the lying rate. The originator of the test may have intended that a sufficient period of complete rest in the horizontal position should be allowed before the lying pulse rate was taken; as commonly carried out, however, this precaution is not observed, and the pulse rate observed immediately after lying down is the one that is recorded.

The question may be raised as to whether it is necessary to interpret the results of the test in this manner; for the results at each stage might be taken independently, and the absolute values compared with the limits of the normal for that position or exercise. There seems to be a good reason why this should not be done: The absolute pulse rate at any stage is a resultant of general nervous and metabolic factors from which the part that the cardiovascular mechanism plays cannot be disentangled. But if the resting pulse rate, no matter how many unknown factors enter into its determination, is accurately measured and taken as the foundation of the test, it becomes possible to judge the effect produced by stimuli that call especially for the coordinated activity of this cardiovascular mechanism. Standing and hopping are stimuli of this nature. They are a strain calling for a new adjustment of the heart and blood vessels. One aspect of this adjustment manifests itself in a quickening of the pulse rate over the level that obtains at rest. And it is only this excess over the resting rate that can be taken as an indication of the mode of reaction of the cardiovascular system, not the absolute rates themselves, which are largely influenced by other factors.

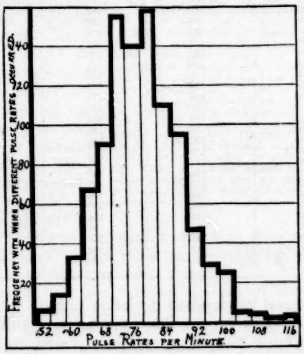

Chart 3.—Frequency distribution of pulse rates observed in the lying position in 1,000 normal recruits.

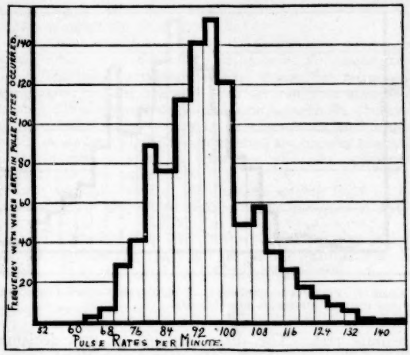

Chart 4.—Frequency distribution of pulse rates observed in 1,000 normal recruits in the standing position.

A MODIFICATION OF THE REGULATION EXERCISE TEST

The only modification required is that the subject should lie quietly on his back for a length of time sufficient to allow the pulse rate to fall to its true resting level. The probability that this modification would be found necessary was apparent before the observations were started; and in order to test the validity of the theoretical considerations on which it is founded, the same 214 normal recruits were directed to lie on their backs for at least fifteen minutes after the pulse rates for the regulation test had been recorded. The pulse rate was then counted as they lay and again immediately after they stood up. The remainder of the test was carried out in exactly the same manner as in the regulation test, the rates immediately and two minutes after 100 hops being recorded.

TABLE 2.—RESULTS OF THE MODIFIED TEST ON NORMAL RECRUITS ARRANGED IN GROUPS ACCORDING TO THE LYING RATE

No. of Cases in Group	Average Pulse Rates per Minute				Percentage Relation to Lying Rate			
	Lying	Standing	Hopping	Afterward	Lying	Standing	Hopping	Afterward
11	68	92	100	72	100	135	146	105
16	72	97	102	75	100	135	142	104
26	76	98	105	78	100	129	139	102
39	80	100	113	83	100	125	141	103
37	84	106	114	87	100	127	136	103
27	88	106	118	88	100	120	135	100

From the figures thus obtained, the percentages of the standing, hopping and after rates to the lying rate were calculated, the numbers in each class being kept for the purpose of comparison the same as in those in Table 1. These percentages are given in Table 2 and Chart 2.

When the curves in Chart 2 are compared with those in Chart 1, it is apparent that they are less

irregular, though they are still far from being smooth. This may be taken as indicating a lesser degree of variability in the pulse rate reactions under the conditions of the modified test.

On account of this finding, it was decided to abandon the regulation test, and to determine the limits of variation in pulse rate reactions in normal recruits whose lying rate had been obtained after a period of

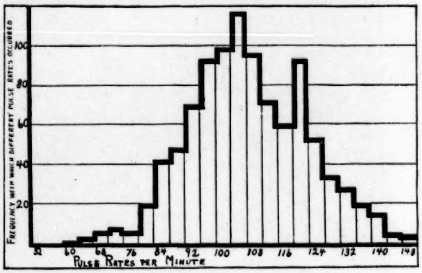

Chart 5.—Frequency distribution of pulse rates observed in 1,000 normal recruits immediately after hopping.

absolute rest. The disadvantages of this decision were fully recognized. The test as modified ceases to be universally applicable, for in the building in which the board works it is impossible to have any considerable number of men lying down at any one time. The possibility of taking the standing rate as the basis of the test was considered, but it is impossible to standardize any method of standing. The muscular effort put into the act varies with different individuals, and the strain it induces is too variable. The conclusion cannot be avoided that the only way to obtain a true basis for the test is to precede it by a period of complete muscular relaxation.

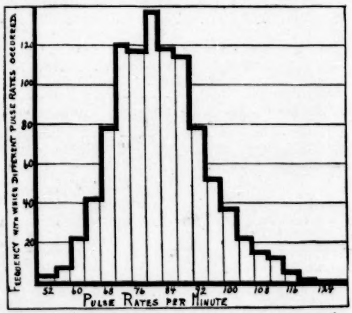

Chart 6.—Frequency distribution of pulse rates observed in 1,000 normal recruits two minutes after hopping.

THE LIMITS OF NORMAL VARIATION IN THE PULSE RATE REACTIONS OF RECRUITS TO THE MODIFIED REGULATION TEST

The pulse rates of 1,000 normal recruits were counted under the conditions of the modified regulation test. The average pulse rate lying down was 78, standing 94, after hopping 107, and two minutes afterward 82. The frequency distributions for each stage of the test in class intervals of 4 pulse beats per minute are given in Charts 3 to 6.[1]

It was shown in the preceding sections that the degree of increase in pulse rate on standing and after exercise is dependent in part on the level of the lying or basal rate. It follows, therefore, that the normal limits of variation are not to be obtained by simply finding the standard deviation of the pulse rates of all the normal recruits. The material must be grouped into classes in accordance with the order of magnitude of the lying pulse rates. Each class must then be

TABLE 3.—AVERAGE AND STANDARD DEVIATIONS OF THE PULSE RATE REACTIONS OF 1,000 NORMAL RECRUITS

Group	No. of Cases	Lying Av.	Standing Av. σ	Hopping Av. σ	Afterward Av. σ
50- 59	22	55	75 ± 6.5	87 ± 12.1	63 ± 9.5
60- 69	193	65	85 ± 9.4	98 ± 13.9	71 ± 7.4
70- 79	395	74	91 ± 9.5	103 ± 12.3	78 ± 7.9
80- 89	358	83	98 ± 9.4	111 ± 12.9	87 ± 8.4
90- 99	78	94	108 ± 11.0	120 ± 12.5	95 ± 9.3
100-109	37	102	114 ± 9.9	128 ± 9.0	104 ± 8.5
110-119	7	114	125 ± 13.4	143 ± 9.0	116 ± 5.2

TABLE 4.—UPPER LIMITS OF NORMAL IN PULSE RATE REACTIONS UNDER CONDITIONS OF MODIFIED TEST FOR BASAL RATES BETWEEN 44 AND 128

Basal Rate	Standing	Hopping	Afterward
44	77	92	61
46	79	94	62
48	80	96	64
50	82	97	66
52	83	99	67
54	85	100	69
56	86	102	71
58	88	103	72
60	90	105	74
62	91	107	76
64	93	108	78
66	94	110	80
68	96	111	81
70	97	113	83
72	99	115	85
74	101	116	86
76	102	118	88
78	104	119	90
80	105	121	92
82	107	122	93
84	108	124	95
86	110	126	97
88	112	127	99
90	113	129	100
92	115	131	102
94	117	132	104
96	119	134	106
98	120	135	107
100	121	137	109
102	123	139	111
104	125	140	113
106	126	142	114
108	128	144	116
110	130	145	118
112	131	147	120
114	133	149	122
116	134	150	123
118	136	152	125
120	138	154	127
122	139	155	129
124	141	157	130
126	142	159	132
128	144	160	134

averaged and its standard deviation found. When this is done, it will be possible to refer any subsequent record to the particular standard found in normal recruits with the same or approximately the same basal rates as in the record whose normality or abnormality it is desired to determine.

In dividing the data into classes it was thought best to use a class interval of 10 pulse beats in order that the average and standard deviations might be obtained

1. These charts show indications of errors in pulse counting. In Chart 5, for instance, the curve of descent is broken by a marked increase in the number of pulse rates of 120 per minute. This rate as actually counted was 30 for a quarter of a minute, and the increase at this point is doubtless due to a tendency to record rates of more than 20 or less than 31 as the round number 30.

from larger groups than would have resulted had the natural class interval of 4 been adopted. The averages and standard deviations of these groups are given in Table 3 and Chart 7.

In Chart 7 the averages given in Table 3 are plotted as points on a chart in which the abscissa measures the magnitude of the lying or basal pulse rate average, and the ordinates the average pulse rates on standing, hopping and after. The limits of normal variation for each group are given by adding each standard deviation to its corresponding average. This gives the upper limit of variation. The lower limit could be obtained by subtracting the standard deviations from the averages, but this limit is of little practical importance since it may be assumed that, in the great majority of cases at least, circulatory disability will lead to an increase and not a decrease beyond the usual pulse rate levels. The sum of the average and the standard deviation is indicated on the chart by a circle, and the lines joining the circles and points represent the standard deviations of the groups. The upper limits of normal variation for the particular basal rates given by the averages of the groups having thus been determined, an approximation to the limits of all basal rates can be obtained by the curves joining these determined limits.

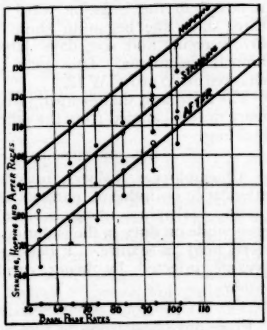

Chart 7.—Limits of normal variation, averages and standard deviations derived from 1,000 observations on normal recruits with the modified regulation exercise test, arranged in groups according to the magnitude of the basal rates. The limits of normal variation are indicated by hollow circles and averages by solid black circles. Standard deviations are shown by the line joining the averages to the limits of normal variation. The curves drawn through the points at which the limits of normal variation have been actually determined give the limits of normal variation in pulse rates on standing, hopping and after for all basal rates.

It would appear from the available data that these curves may be straight lines and that the curve for each stage of the test may be regarded as parallel to the others. They have been drawn in this manner in Chart 7, and from them Table 4 has been drawn up which gives the upper limits of the normal of the standing, hopping, and after rates for any observed basal rate.

The following is a detailed account of the method used in obtaining the normal standard, and accordingly of the manner in which the test ought to be carried through with any individual whose record is to be compared with the standard:

1. The recruit lies on his back without moving for fifteen minutes. The pulse rate is then taken. If the rate exceeds 88 per minute he lies still for another fifteen minutes before the pulse is counted.

This is called the basal pulse rate.

2. The recruit rises from bed and stands up. While he is doing so the observer's fingers should be on his wrist, so that he can begin to count the pulse rate as soon as the patient is erect. He counts for fifteen seconds only.

This is called the standing pulse rate.

3. The recruit is then directed to hop 100 times on the left foot at a rate of about two hops to the second. If no one counts for him, he should be told to count the hops himself.

Immediately on the completion of the 100 hops, the recruit lies on his back in bed, and the pulse rate is counted for the first fifteen seconds after he lies down.

This is called the hopping pulse rate.

4. The recruit continues to lie on his back, and exactly two minutes after the completion of the hopping count, the rate is taken again for fifteen seconds.

This is called the after pulse rate.

The counts should begin when the second hand covers one or the other of the five-second divisions of the second hand dial. This may necessitate waiting almost five seconds in some cases, but it is generally more accurate than attempting to gage the position of the second hand between the divisions.

Some find it an advantage to set the minute hand of the watch on an hour division on completing the hopping count, in order to make it easier to determine when the two-minute interval has been completed.

Care must be taken to see that the minute hand of the watch does not obscure the reading of the second hand dial.

This standard is in use by the cardiovascular board, but it is too early as yet to form an opinion as to its value. It is also employed as an aid in the grading of cases of neurocirculatory asthenia, and the results are being compared with those obtained by other tests. There is some indication, furthermore, that successive tests carried out on convalescent patients may be of assistance in determining when they should be returned to duty.

When it is found that the pulse rate records of an individual exceed the limits of normal variation at any one or all of the stages of the test, it must be remembered that this simply means that he shows a greater degree of pulse rate acceleration than the great majority of normal recruits. It is not in itself an absolute indication of neurocirculatory disability. It can be of value only in association with other evidence. Indeed, it could hardly be expected that any result of absolute significance as to the effect of strain on the circulatory mechanism is to be obtained from a test in which the only measurement made is that of the pulse rate, for the pulse rate increase on change of position and on exertion is only one factor in a series of complexly interrelated adjustments. But an essential requisite of any test to be used for the purpose we had in view is simplicity and ease of application, and it is doubtful whether anything more exacting than this modification of the regular exercise test would be practicable.

Summary of State Laws on Infantile Blindness.—The reporting of babies' sore eyes to the local health officer or to a physician is compulsory in forty-one states; the reporting law is printed on the birth certificate in ten states; local health officers are authorized and required to secure medical attention for uncared-for cases, or to warn parents of the dangers and advise immediate treatment in twenty-eight states; births are reported early enough to be of assistance in preventing blindness in seventeen states; the question as to whether or not measures were taken to prevent blindness is included in the birth certificate in nineteen states; free prophylactic outfits are distributed in twenty-two states; use of prophylactic is compulsory in nineteen states, and strongly recommended in an additional four states; popular educational leaflets relating to preventable blindness are distributed by state health departments in 29 states. The National Committee for the Prevention of Blindness in its *News Letter*, December, 1918, prints a tabulated summary of state laws and rulings relating to the prevention of blindness from babies' sore eyes.

INFLUENZA EPIDEMIC AT THE CHICAGO STATE HOSPITAL

EDWARD A. FOLEY, M.D.
CHICAGO

Fifteen days following the outbreak of influenza at the Great Lakes Station, the disease made its appearance at the Chicago State Hospital. The first patient was a voluntary worker in the occupational therapy department. So far as can be learned, this young woman had not come in contact with an active case of influenza. However, she had been to Chicago. Following this case, both patients and employees rapidly began to show infection. The total number treated during the next six weeks was 507 inmates and fifty-two employees. Of the 507 patients ill with the disease, 349 were males and 158 females. The total number of deaths among the inmates was eighty-one or 16.2 per cent. The incidence of death according to sex was: males, forty-eight, or 13.7 per cent., and females, thirty-three, or 20.8 per cent.

DISTRIBUTION OF THE DISEASE

The colored population of the institution is made up of 139 people, seventy-three of the 139 being males and sixty-six females. The number of colored patients showing symptoms of influenza was not very large. Six men and seven women were admitted to the isolation wards. All the men recovered. One woman died; one developed pulmonary tuberculosis; five recovered.

TABLE 1.—INCIDENCE OF INFLUENZA ACCORDING TO PSYCHOSES

Psychoses	Number
Dementia praecox group	193
Epileptic	55
Alcoholic (all types)	53
Mental defective (all types)	49
Organic brain disease (including paresis)	45
Senile dementia	35
Undiagnosed psychoses	43
Manic-depressive group	34

The praecox group constitutes by far the majority of our population; consequently one would look for a larger number of this type involved than any other. Table 1 shows the incidence of the disease among the various psychoses:

Next to the praecox group, the epileptics were most severely affected. The males of this class more easily become victims than the females. Within the first week of the onset of the disease, the greater part of the male epileptics were confined to bed. The mortality among this type was very small.

The ages of those ill are given in Table 2; the number of days ill in the isolation ward, in Table 3.

Among the fifty-two employees who became ill, the mortality was only 3.8 per cent.

INFLUENCE OF ISOLATION

The farm ward, located some distance from the cottages and the main building, houses seventy men. These men rarely come in contact with other patients, and are outdoors most of the time. Influenza failed to claim any of this colony. Other wards in the hospital group failing to show infection were wards wherein female patients are confined. In one of these units are housed our laundry workers. The women go back and forth to the laundry four times daily. They rarely come in contact with other inmates, and only with those employees with whom they work.

The second female unit not showing infection (C W 12) constituted a group that worked in the hospital building and sleep in C W 12 at night. One of this group became infected in the following manner: One of her friends was admitted to the isolation ward with a frank case of influenza. Through a mistake the patient gained admission to the ward to visit her friend. She was discovered at the bedside without having provided herself with a mask. That night she did not return to Ward C W 12, but slept on the lower floor of the hospital building. Two evenings following her visit, she was reported to have an elevation of temperature. She was immediately removed to the isolation ward for observation. In three days she began to show signs of pulmonary involvement, and five days later she died from a bronchopneumonia. This case cannot therefore be charged to Ward C W 12.

TABLE 2.—AGE INCIDENCE

Age	Number
Under 20	20
From 20 to 30	172
From 30 to 40	118
From 40 to 50	84
From 50 to 60	64
From 60 to 70	41
From 70 to 80	5
Over 80	5

The third unit that escaped infection was Ward A 1, more or less isolated from the other wards of the main building.

USE OF THE FACE MASK

All employees, helpers, nurses and physicians in attendance on influenza patients always wore the face mask. Only three nurses became infected with influenza while on duty in the isolation ward. The attacks were mild in nature. I believe that these nurses became infected by being careless regarding the masks.

PROGNOSIS

From our observation of the cases under treatment we could not judge the patient's condition by the temperature. Some patients appeared to be comfortable with a high temperature, while others whose temperature had been normal or near normal for several days died. The pulse and respiration, like the temperature, were often misleading. Each patient had to receive as much individual attention as could be given. Epistaxis was noted in about 20 per cent. of the cases. Contrary to a statement that those cases in which nosebleed occurred had a favorable prognosis, our observation was that this condition is not a criterion on which to judge the outcome of a case. Some of the patients showing this sign died, while others recovered. It was noticed that epistaxis occurred when the temperature was high—from 104 to 105 F. In the women patients early menstruation was a feature; this was noted especially among women employees. Several of the employees describe delusional experiences while ill. During convalescence, otitis media developed in several of the inmates and employees.

TABLE 3.—DURATION OF ILLNESS*

Duration	Number
From 1 to 5 days	139
From 5 to 10 days	127
From 10 to 15 days	84
From 20 to 25 days	44
From 25 to 30 days	10

* Forty-eight patients were still in the isolation ward at the time of the compilation of this report.

EQUALITY OF DISTRIBUTION

The wards housing the more deteriorated type of cases did not show any more infections than those in which the more robust inmates reside. In a ward known as D W 3, there are housed seventy-four male patients of various types, showing deterioration. From their lowered mentality and physical status, one would naturally expect that among this type of individuals infection would find many victims. During the epidemic this ward was watched with a great deal of anxiety. When the wave of the epidemic had passed, we were pleased to note that out of the seventy-four inmates of this ward, only eleven were sent to the isolation wards suffering from influenza.

How to explain why we did not have more cases of illness among those of lowered mental status, which consequently lessens resistance, still remains one of the mysteries of the epidemic. In Wards C W 13, 14 and 15, known as the "industrial wards," housing male patients who are outdoors a great deal, the number of cases of infection was small. The ward showing the most cases was Ward D W 4, housing the epileptics.

The infection was, however, distributed throughout the institution. It is difficult to understand why we did not have more cases. Perhaps this was due to the fact that persons showing signs of illness were immediately transferred to isolation wards, and all precautions were taken to prevent further transmission of infection.

RECURRENCES

Two persons who had had influenza in the first epidemic were readmitted to the isolation wards: In the first patient, admitted for the first time, October 9, the disease ran a typical course, and the patient was discharged, October 18. The patient was readmitted, December 5, with frank influenza, and the temperature ran an irregular course until December 15, since which time it has been normal. The second patient, first admitted to the isolation wards, October 17, and discharged, November 8, was readmitted, December 15, and died, December 23, of bronchopneumonia.

CONTRIBUTION TO THE ETIOLOGY OF YELLOW FEVER*

HIDEYO NOGUCHI, M.D.

NEW YORK

During the past four months (from July to November, 1918), I have been engaged at Guayaquil, Ecuador, under the auspices of the International Health Board of the Rockefeller Foundation, in the study of the etiology of the yellow fever prevalent there. I wish at this time to record briefly some of the more significant results of this study, pending the fuller publication of the details which will follow.

In the later paper acknowledgment will be made of the cordial and indispensable official and professional cooperation of the National and Municipal Health authorities in Guayaquil, especially that of Dr. W. Pareja, the director of the Yellow Fever Hospital, and Dr. León Becerra, director-general of the health department of Ecuador.

In six out of twenty-seven cases studied, the injection into guinea-pigs of the blood of yellow fever patients, after a period of incubation, induced in these animals first a rise of temperature with the appearance of rapidly increasing albumin and casts in the urine. Simultaneously the conjunctivae, ears and soles became highly hyperemic, and leukopenia set in. A fall of temperature by lysis soon occurred, with the development of distinct and gradually deepening yellow pigmentation of the sclerae, skin and viscera. During this period hemorrhages from the mucous membranes of the nose, mouth and gums occasionally took place, and petechial hemorrhages of the skin, muscles, heart and kidney were often observed. Congestion and hemorrhages were almost always present in the mucous membranes of the gastro-intestinal tract, giving the contents the dark, tarlike appearance of so-called black vomit, and the lungs showed large and small hemorrhages. The liver and kidneys showed petechial hemorrhages and evidences of degeneration. Intense general jaundice, cholemia, oliguria with abundant albumin, casts and bile pigment, and sometimes anuria, marked the later stage of the infection. With the development of these manifestations, the animals usually died in coma or convulsions.

Dark field examination of the blood, liver and kidneys of these inoculated animals revealed the presence of an organism whose morphologic characters closely resembled those of the organism (*Leptospira*) previously described in cases of infectious jaundice.[1]

By the use of special methods the organism found in the blood, liver and kidneys of animals inoculated with the blood of yellow fever patients has been obtained in pure culture.

In some instances the direct dark field examination of the blood and liver of yellow fever patients in Guayaquil showed the presence of a leptospira indistinguishable from that described as occurring in the blood and viscera of the experimentally infected guinea-pigs. By special methods, pure cultures of this organism were obtained directly from the blood of yellow fever patients in a limited number of cases.

This organism does not grow on ordinary bacterial culture mediums, and when grown on the special mediums it induces no macroscopic changes of the latter and hence may be easily overlooked. Only by a very thorough dark field examination of such cultures can the occurrence of growth be ascertained.

By the inoculation of the blood and emulsions of the liver and kidneys of infected guinea-pigs, the infective agent has been conveyed from animal to animal without loss of virulence through successive series (now numbering eighteen); and pure cultures of the organism are obtainable during the course of the infection from any animal of these series.

When cultures of the organism, derived either from the inoculated animals or directly from the blood of a yellow fever patient, were inoculated into guinea-pigs, monkeys (marmosets) and puppies, symptoms and lesions were induced which were similar to those outlined as occurring from a successful inoculation of guinea-pigs directly with blood from yellow fever patients. The organism recovered in pure culture from these inoculated animals has retained its original characteristics.

Many of the guinea-pigs that did not succumb to the inoculation with the blood from yellow fever patients showed definite febrile reaction, some with a

* From the Laboratories of The Rockefeller Institute for Medical Research.

1. Inada, Ido, Hoki, Kaneko and Ito: J. Exper. Med. **23**: 377, 1916. Noguchi: Ibid. **27**: 575, 1918.

trace of jaundice, for several days, but soon returned to normal. Most of these guinea-pigs later proved resistant to infection with virulent organ emulsions or with cultures of the organism; while control animals (normal guinea-pigs or those inoculated previously with blood of patients suffering from other diseases than yellow fever) died, with characteristic symptoms and lesions.

A positive Pfeiffer phenomenon was obtained in the majority of instances with serum derived from convalescents from yellow fever in Guayaquil when tested with the organism (*Leptospira*) isolated from the yellow fever cases or from infected animals. This was also true of the serum of animals that survived experimental infection.

Characteristic symptoms and lesions were induced in susceptible animals by inoculation with the filtrates obtained by passage through Berkefeld filters V and N of the blood of experimentally infected animals, and the emulsions of the liver and kidney of these animals and of the cultures of the organism. *Leptospira* was demonstrated in the blood or visceral organs of the animals thus inoculated.

The filtrability of the infective agent of yellow fever has been observed by earlier investigators.[2]

RELATION OF INFLUENZA BACILLUS TO THE RECENT EPIDEMIC OF INFLUENZA *

FREDERICK T. LORD, M.D.
ARTHUR C. SCOTT, JR., M.D.
AND
ROBERT N. NYE, M.D.
BOSTON

Pfeiffer[1] found influenza bacilli in all fresh uncomplicated cases of influenza in almost pure culture. His investigation was carried out for the most part on persons seeking hospital care for the more severe attacks of bronchitis and bronchopneumonia. Influenza bacilli were found only in influenza patients with and convalescent from influenza, a fact of great importance in Pfeiffer's opinion in establishing the specific nature of the organism. In three cases of bronchopneumonia complicating diphtheria, organisms closely resembling influenza bacilli were found but somewhat larger and with an outspoken tendency to the formation of longer thread forms. Such organisms he called pseudo-influenza bacilli.

Subsequent workers have failed to confirm the presence of a group of pseudo-influenza bacilli. Such differences as Pfeiffer described are to be regarded as variations in morphology in different generations and on different culture mediums.

In the period immediately following the great pandemic of 1889-1890, and subsequent to Pfeiffer's work, influenza bacilli were found by different workers in a considerable proportion of cases in local outbreaks of influenza, but only rarely in such constancy as he had described. In the widespread epidemic in the United States in 1907-1908, Lord[2] found influenza bacilli in practically pure culture in only three of twenty cases. Among twenty-three cases, Davis,[3] from Chicago, found the organism in only four.

Between August, 1902, and January, 1904, Lord[4] investigated 186 sputums from patients with acute and chronic infection of the respiratory tract, exclusive of tuberculosis. As shown in Table 1, organisms

TABLE 1.—INCIDENCE OF INFLUENZA BACILLI IN RESPIRATORY INFECTIONS DURING INTEREPIDEMIC PERIOD, 1902-1904

		Influenza bacilli					
		Mixed with Other Organisms in Smears		In Cultures		In Overwhelming Numbers	
No. of Cases	Source of Material	No.	Per Cent.	No.	Per Cent.	No.	Per Cent.
186	Sputum	110	59	56	30	47	25

having the morphology and staining reaction of influenza bacilli, mixed with other bacteria, were found in smears in 110 (59 per cent.). In fifty-six cases (30 per cent.) the organisms were shown by culture to conform in all respects to Pfeiffer's bacillus. In forty-seven cases (25 per cent.) they were in overwhelming numbers. The cases were quite evenly distributed over the eighteen months during which the investigation was conducted, and no epidemic of acute respiratory infection prevailed during this period. Patients with chronic respiratory infection were found to harbor the influenza bacillus for years in the sputum. Many such cases seemed to have begun insidiously without an acute attack at the onset. The acute cases in which influenza bacilli existed as a practically pure infection in the interepidemic period presented no clinical or pathologic difference from those with other organisms and in which no influenza bacilli could be found. The symptoms of onset, the course and termination were practically the same in those with and those without influenza bacilli.

Normal individuals are known to harbor influenza bacilli. Rosenthal[5] found them in the larynx and trachea in about one of six normal persons or those with nonrespiratory disease. Davis[3] found them in small numbers in swabs from the throat in two (10 per cent.) of twenty normal persons. Holt[6] reports

TABLE 2.—INCIDENCE OF INFLUENZA BACILLI IN NORMAL PERSONS DURING EPIDEMIC PERIOD

		Influenza bacilli					
		Mixed with Other Organisms in Smears		In Cultures		In Overwhelming Numbers in Culture	
No. of Cases	Source of Material	No.	Per Cent.	No.	Per Cent.	No.	Per Cent.
34	Swabs from upper pharynx	14*	41	26†	76	10	29

* The small number of positive smears may be ascribed to the difficulty of identifying small numbers of influenza bacilli.

† The colonies of influenza bacilli were tested for growth on plain agar in fourteen. No growth was obtained.

the presence of influenza bacilli in 49 (19 per cent.) of 254 persons with nonrespiratory disturbance.

It was considered desirable to determine the incidence of influenza bacilli in normal individuals during the epidemic period. For this purpose cultures were made from swabs brushed over the upper part of the

2. Carroll: Senate Document 822, 61st Cong., 3d sess., Washington, 1911, p. 156. Marchoux, Salimbeni and Simond: Ann. de l'Inst. Pasteur **17**: 677, 1903.

* The investigation was made at the Massachusetts General Hospital under the supervision of Dr. Lord. Most of the work was done by Drs. Scott and Nye, assisted by the following Harvard Medical student volunteers: Joseph Garland, Alfred M. Goodale, Eliot Eubbard, Jr., Joe V. Meigs and Eugene C. Peck.

1. Pfeiffer: Ztschr. f. Hyg. **13**: 357, 1893.

2. Lord: J. M. Res. **19**, n. s. **14**: 295-299, 1908.

3. Davis, D. J.: Influenza and Influenzal Pneumonia, Arch. Int. Med. **2**: 124 (Sept.) 1908.

4. Lord: Boston M. & S. J., May 11 and 18, 1905.

5. Rosenthal: Compt. rend Soc. de biol. **52**: 266, 1900; **55**: 1500, 1903.

6. Holt: Tr. Assn. Am. Phys. **25**: 223, 1910.

pharyngeal wall of thirty-four young men, members of the Harvard Students' Army Training Corps at Cambridge, none of whom gave a history of any illness during the preceding three months. In this training corps the incidence of influenza was 9.3 per cent., as shown by Minot and Loeb.[7] This proportion was very low compared to that in other groups in this community. As shown in Table 2, organisms resembling influenza bacilli in morphology and staining reaction were demonstrated in fourteen (41 per cent.) of the thirty-four cases. Influenza bacilli were found in culture in twenty-six (76 per cent.). They were in overwhelming numbers in ten cases (29 per cent.).

Through the kindness of Dr. J. H. Wright, complement fixation tests were made on the blood in twenty-seven of the Students' Army Training Corps cases, both with a monovalent and with a polyvalent influenza bacillus antigen obtained from influenza cases during the epidemic. No difference was noted in the result with the monovalent and the polyvalent antigen. In seventeen cases, there was a correspondence in the positive swab and the positive complement fixation test. In four cases, both were negative. In four cases, the throat swab was positive and the complement fixation test negative. In two cases, the complement fixation was positive and the throat swab negative. Though no definite conclusions can be drawn, the findings are suggestive of a response in the blood to the presence of influenza bacilli in the throat as shown by the complement fixation test.

It has been shown that influenza bacilli are frequently present in the material from the respiratory tract of patients with tuberculosis, measles, scarlet fever, diphtheria and varicella, as shown in Table 3.

TABLE 3.—INCIDENCE OF INFLUENZA BACILLI IN VARIOUS INFECTIONS

Author	Reference	Source of Material	No. of Cases	Influenza Bacilli	
				No.	Per Cent.
Tuberculosis:					
Wollstein.....	J. Exper. Med. 8, No. 6, 1906	Infant's bronchial or nasal secretion	24	8	33
Measles:					
Jehle.....	Ztschr. f. Heilk. 22, n. s. 2, Int. Med., 1901	Contents of bronchi, postmortem	23	18	78
Susswein.....	Wien. klin. Wchnschr., 1901, No. 47	Nose or bronchial secretion, postmortem	21	10	47
Liebscher.....	Prag. med. Wchnschr. 28: 85, 1903	Nasal secretion	57	11	19
Wollstein.....	J. Exper. Med. 8, No. 6, 1906	Infant's bronchial or nasal secretion	27	9	33
Davis.....	Arch. Int. Med. 2:124, 1908	Throat or sputum	23	13	56
Scarlet fever:					
Jehle.....	Ztschr. f. Heilk. 22, n. s. 2, Int. Med., 1901	Contents of bronchi, postmortem	48	19	39
Diphtheria:					
Jehle.....	Ztschr. f. Heilk. 22, n. s. 2, Int. Med., 1901	Contents of bronchi, postmortem	15	9	60
Varicella:					
Jehle.....	Ztschr. f. Heilk. 22, n. s. 2, Int. Med., 1901	Contents of bronchi, postmortem	9	9	100

These organisms may be present in from 19 to 100 per cent. of cases. In the study of postmeasles bronchopneumonia due to *Streptococcus hemolyticus*, Cole and MacCallum[8] found influenza bacilli in thirteen (76 per cent.) of seventeen cases.

Investigation of the recent epidemic was begun at the height of the outbreak and lasted from September 28 to October 24. Only patients in hospital with the more severe types of infection were studied. It was difficult to distinguish between bronchitis and bronchopneumonia in certain cases. Of thirty-eight cases, eight were classed as influenzal bronchitis or questionable bronchopneumonia and thirty as influenzal bronchopneumonia, thus duplicating the character of the material on which Pfeiffer made his investigation.

A typical sample of mucopurulent or mucopurulent and bloody expectoration was obtained from each case. Carefully selected particles of this fresh material were smeared, stained and examined. Organisms resembling influenza bacilli in morphology and staining reaction were thus found mixed with other bacteria in thirty-two (84 per cent.) of thirty-eight cases, as shown in Table 4.

TABLE 4.—INCIDENCE OF INFLUENZA BACILLI IN HOSPITAL PATIENTS DURING 1918 EPIDEMIC

No. of Cases	Source of Material	Influenza bacilli: Mixed with Other Organisms in Smears		Influenza bacilli: In Cultures*		Influenza bacilli: In Overwhelming Numbers in Culture	
		No.	Per Cent.	No.	Per Cent.	No.	Per Cent.
38	Sputum	32	84	30	78	14	36
15	Lung tap, postmortem, 9 cases	..	..	6	66	1	11
	Chest tap, antemortem, 6 cases	..	..	4	66	2	33
4	Lung scraping, postmortem	..	..	1	25		

* The colonies of influenza bacilli were tested for growth on plain agar in twenty-seven cases. No growth was obtained.

Cultures on blood agar were made of washed particles of sputum, and the prevalence of influenza bacilli was noted in thirty-eight cases. Colonies of influenza bacilli with those of other bacteria were found in thirty (78 per cent.) of the cultures. In fourteen cases (36 per cent.), influenza bacilli were present in overwhelming numbers on comparison with other organisms. Varying numbers of organisms resembling *Micrococcus catarrhalis*, the pneumococci, pyogenic cocci, hemolyzing and nonhemolyzing streptococci, etc., were found mixed with the colonies of influenza bacilli.

Lung tap in the involved region immediately after death was made in nine cases. Influenza bacilli were found in culture from this material in six (66 per cent). They were present in overwhelming numbers in one (11 per cent.). In this case they were in pure culture. In all the other cases they were mixed with other organisms. Serofibrinous or purulent fluid obtained from the chest of patients with influenzal bronchopneumonia was examined in six cases. Influenza bacilli with other organisms were found in culture in four (66 per cent.), and in overwhelming numbers in two (33 per cent.). Postmortem scrapings from the involved part of the lung showed influenza bacilli with other organisms in one (25 per cent.) of four cases.

The finding of influenza bacilli in the wards cannot be ascribed to cross infection, as influenza bacilli were present in the sputum of eight (88 per cent.) of nine cases examined within twenty-four hours of entrance, a proportion higher than the general incidence (78 per cent.) of influenza bacilli in the series of cases in which sputum examinations were made.

Concerning the pathogenic power of influenza bacilli, the evidence is insufficient to reach a conclusion; but, in spite of negative animal experiments, their presence in enormous numbers to the practical exclusion of other organisms in certain cases in the sputum during life and in the lung tissue after death

7. Minot, G. R., and Loeb, R. F.: Boston M. & S. J. **170**:665, 1918.
8. Cole, R., and MacCallum, W. G.: Pneumonia at a Base Hospital, J. A. M. A. **70**:1146 (April 20) 1918.

suggests that they are important contributory or principal factors in causing pathologic changes in man. Their occasional presence as the sole apparent cause of meningitis and suppurative lesions in various parts of the body is still further suggestive of their pathogenic power.

The most interesting question concerns the specificity of influenza bacilli in relation to influenza. Pfeiffer's most convincing argument, in the absence of positive animal experiments, was their presence only in patients with and convalescent from influenza. If the organism were the cause of epidemic and pandemic influenza, it must, however, contrary to Pfeiffer's contention, prevail during interepidemic periods. Its biologic peculiarities suggest that it cannot exist for long under any ordinary conditions apart from the human host and that it must be maintained in chronic carriers or by repeated transfer from person to person. An occurrence in 59 per cent. by microscopic examination, 30 per cent. by culture, and 25 per cent. in overwhelming numbers, in acute and chronic nontuberculous respiratory infections during interepidemic periods would serve to bridge the gap between and keep the organism alive for recurring outbreaks. During the interepidemic period, however, those cases which show influenza bacilli as a practically pure infection present no clinical or pathologic difference from respiratory infection in which other organisms predominate and in which influenza bacilli cannot be found.

The influenza bacillus is part of the flora of the normal respiratory tract, investigations previous to the recent epidemic having shown it to be present in from 10 to 19 per cent. In our series of thirty-four normal individuals, examined during the epidemic period, influenza bacilli were found in 76 per cent. by culture and in 29 per cent. in overwhelming numbers. Means of identifying influenza bacilli are limited to the morphology, staining reaction and cultural peculiarities of the organism, and it cannot be stated whether or not the bacilli harbored by normal persons are of the same type as those found in the presence of a respiratory disturbance; but when judged by these criteria they appear to be the same. The frequency with which they are present in normal individuals may be regarded as determining their incidence in diseased conditions.

The influenza bacillus is a frequent finding in the secretions from the respiratory tract under such a variety of conditions as pulmonary tuberculosis (33 per cent.), measles (from 19 to 78 per cent.), scarlet fever (39 per cent.), diphtheria (60 per cent.) and varicella (100 per cent.). The organism certainly cannot be regarded as of etiologic importance in these diseases, but may be of significance as a secondary invader.

The character and distribution of the recent epidemic of influenza indicate that it is to be regarded as the same disease that has prevailed in epidemic form at intervals during the past four centuries and last occurred as a great pandemic in 1889-1890. While much doubt has been expressed concerning the relation of Pfeiffer's bacillus to epidemic influenza, no definite conclusion could be reached until an outbreak like that through which we have just passed afforded the necessary opportunity for investigation. Our material, like Pfeiffer's, comprised the more severe cases of bronchitis and bronchopneumonia in hospital. We have been unable to confirm his constant finding of the organism in almost pure culture. It has been demonstrated in our epidemic series in 84 per cent. by microscopic examination, in 78 per cent. by culture, and in 36 per cent. in overwhelming numbers.

Comparison with the findings by similar methods in an interepidemic period of 59 per cent. by microscopic examination, 30 per cent. by culture and 25 per cent. in overwhelming numbers, indicates that there is no considerable rise at least in the most important group, namely, that in which the organisms were present in overwhelming numbers. It is a common invader of the normal respiratory tract and may be found in a considerable proportion of cases with pulmonary tuberculosis and the contagious diseases of childhood. There seems to be no justification for the belief that the epidemic was due to the influenza bacillus, which is probably a secondary invader and bears about the same relation to the influenza cases as to respiratory infections of a different sort.

THE PRODUCTION OF MENINGITIS BY RELEASE OF CEREBROSPINAL FLUID

DURING AN EXPERIMENTAL SEPTICEMIA: PRELIMINARY NOTE *

LEWIS H. WEED, M.D.
PAUL WEGEFORTH, M.D. (SAN DIEGO, CALIF.)
JAMES B. AYER, M.D. (BOSTON)
Captains, M. C., U. S. Army
AND
LLOYD D. FELTON, M.D.
Contract Surgeon, U. S. Army
BALTIMORE

In the course of the experimental study of meningitis, it was found that a certain strain of *B. mucosus-capsulatus* possessed particular virulence within the meninges of laboratory animals. A typical acute and fatal leptomeningitis was produced by the direct subarachnoid injection of very small numbers of these organisms; the affected animals showed characteristic signs of meningeal infection, dying in from eight hours to five days. The number of these bacilli necessary for the production of such an infection was far smaller than with any other strain or class of organisms tested. The particular strain of *B. mucosus-capsulatus* used in these observations is, according to the classification of Perkins, *B. lactis-aerogenes*, being differentiated from others of the group by the sugar reactions. It is an encapsulated, nonspore-forming, gram-negative, nonmotile bacillus, with a tendency to occur in varying lengths of chains. This organism was isolated from the lungs and blood of a patient dying of bronchopneumonia.

Later experiments leading to another end were undertaken: These concerned the intravenous injection of this organism in doses of from 0.5 to 1 c.c. of a twenty-four hour broth culture. None of these cats developed meningitis, but remained normal throughout the period of observation. In one case, shortly after such experimental injection into the blood stream, cerebrospinal fluid was removed by puncture. The next day the animal showed signs of meningeal irrita-

* From the Army Neurosurgical Laboratory, Johns Hopkins Medical School.

tion, and a second puncture with withdrawal of cerebrospinal fluid was done. The fluid was definitely turbid, contained 5,800 white blood cells, and yielded a positive culture of *B. mucosus-capsulatus*. In the smear from this fluid many bacilli were present. The animal died in twenty-eight hours, and at necropsy a typical exudative leptomeningitis was found.

MENINGITIS BY B. MUCOSUS-CAPSULATUS INTRAVENOUSLY AND WITHDRAWAL OF SPINAL FLUID

Observations on cats were immediately devised to test out the possible relationship of this withdrawal of cerebrospinal fluid during an artificial septicemia to the later production of a meningitis. The series were so arranged that the control animals were given double the intravenous dose of *B. mucosus-capsulatus* (usually 0.5 c.c. of a twenty-four hour meat infusion broth culture). These control cats remained normal and showed no signs of meningeal infection, and were usually killed at the end of a month for histologic control. The other cats in this series were given the unit dose of organisms intravenously (usually 0.25 c.c. of the same culture), and two minutes afterward, cerebrospinal fluid was withdrawn. In the routine experiment, from 1 to 2 c.c. of fluid was permitted to escape, and the animal then allowed to recover from the anesthetic. As contrasted the next day with the control cat, which, though receiving double the intravenous dose, was normal and active, the punctured cat would exhibit signs of meningeal infection. Customarily within twenty-four hours, the typical signs of such meningeal involvement would be present; the animal would be somewhat hypersensitive, ill and cautious, and would move only on urgent necessity. On retraction of the head, a more or less profound extensor spasm with all four legs outstretched in marked rigidity would be caused. The tendency toward convulsions would become more outspoken as time elapsed, and spontaneous seizures would be noted. During such a spasm death might occur, or the animal might finally go into a coma and die without further signs of meningeal irritation. Pathologically, an acute exudative leptomeningitis would be found.

Subsequently, the procedure outlined above has been repeated in scores of experiments; the production of meningitis by intravenous inoculation followed by release of cerebrospinal fluid has been so certain and so regular that it has become our chief method for the experimental production of the infection. The work has been controlled in many ways, in addition to the routine method of giving one animal in the series an intravenous injection of double amount but without puncture; in a more complete report of this work the cultural controls will be included.

The release of cerebrospinal fluid may be brought about by either lumbar or occipito-atlantoid puncture. The end-result is identical, and approximately the same amount of fluid may be withdrawn by either method. No appreciable difference in the production of meningitis by intravenous inoculation, followed by lumbar puncture, and that by occipito-atlantoid puncture has been noted. Release of fluid by both procedures, with proper dosage of the organism within the blood stream, results invariably in the infection of the meninges. Puncture through the occipito-atlantoid ligament, as practiced by Dixon and Halliburton, is an ideal method for the removal of cerebrospinal fluid in the laboratory mammals.

That this phenomenon of an acute meningitis following intravenous inoculation with release of cerebrospinal fluid was not peculiar to cats was demonstrated by a series of experiments on rabbits, guinea-pigs, white rats and monkeys. In each of these species, the control was given the same or double the intravenous dose as the animal from which the cerebrospinal fluid was removed at the height of the artificial septicemia. In every case the control remained well and normal until killed, while the animals from which spinal fluid was removed promptly developed a typical meningitis with death in ninety-six hours or less. In the two monkeys at our disposal, the same procedure was carried out: the control (receiving only the intravenous injection) remained normal for seven months, dying finally of pulmonary tuberculosis, while the monkey receiving the intravenous injection followed by the withdrawal of cerebrospinal fluid died in fifty-four hours with typical signs of meningitis. The two monkeys were punctured forty-eight hours after the initial injection; in the control, the cerebrospinal fluid contained no white cells, and the culture was negative, while the other had 14,000 white blood cells and yielded a positive culture.

The time relations between the withdrawal of cerebrospinal fluid and the intravenous injection of organisms are of importance. In no case has a meningitis developed when the cerebrospinal fluid was released thirty or more minutes before the intravenous inoculations. If the puncture is done, however, only a few minutes before the inoculation into the blood stream, infection of the meninges occurs as in the other observations in which routine withdrawal of fluid is accomplished at the height of the artificial septicemia. Somewhat analogous are the findings in the time relationship between initial introduction of organisms intravenously and the subsequent withdrawal of fluid.

During the height of a suitable artificial septicemia, the release of fluid invariably causes a meningitis. In one series of experiments, the punctures were delayed for varying periods after the intravenous injection. Animals from which cerebrospinal fluid was withdrawn at least three hours after the intravenous injection developed meningitis. But also animals receiving somewhat larger intravenous doses could not be punctured five hours afterward without developing infection of the meninges. Hence a striking time relation between the degree of the artificial septicemia and the withdrawal of cerebrospinal fluid seems established. It must be assumed that following the intravenous injections of *B. mucosus-capsulatus* the number of bacteria in the circulating blood is constantly diminishing so that in practically all cases of simple intravenous injection the blood is sterile in twenty-four hours. Consequently, delay in removal of cerebrospinal fluid is comparable to administration of a smaller intravenous dose of organisms. Apparently the number of organisms circulating within the blood stream at the time of puncture is one of the crucial factors in determining the infection of the meninges.

Other observations were made to determine how soon this infection of the meninges occurs after the release of cerebrospinal fluid during the height of the septicemia with *B. mucosus-capsulatus*. In these typical experiments the animals were killed one hour, two hours, four hours and six hours after the experimental injection and puncture. The membranes of the central nervous system were then examined in

fresh by means of smears taken from the subarachnoid space, and the findings later controlled by histologic sections. In the one hour case after repeated search one or two large bacilli, morphologically identical with *B. mucosus-capsulatus*, were found in the cerebral leptomeninges but not elsewhere within the meninges. The two hour specimen yielded bacteria only in the cranial portion of the pia-arachnoid, but in considerable numbers. Practically no cellular exudation was present.

Many polymorphonuclears and mononuclears were present in the four and six hour animals; the infection at first was largely within the cerebral meninges, but apparently to a lesser degree the spinal portion of the subarachnoid space was involved. These findings indicate that the infection of the meninges must occur almost immediately after the release of cerebrospinal fluid during such an artificial septicemia.

Pathologically, the meningitis produced by this means is comparable to infection of the leptomeninges in man. In these acute experimental infections there occurs a more or less widespread distribution of purulent matter throughout the subarachnoid space, obliterating all characteristic markings and obscuring contours. With the discoloration due to pus and hemorrhage, there is associated a fairly constant swelling of the nervous system itself, rendering tense the dura of both brain and spinal cord. In a great majority of cases (particularly those under forty-eight hours' duration) the gross distribution of the exudate is almost entirely cerebral; but in a small percentage of the early cases, the exudate may be wholly confined to the spinal meninges. In the more prolonged infections, the involvement of the subarachnoid space is customarily universal. Microscopically, the exudate consists of polymorphonuclear leukocytes, large mononuclear cells, a few phagocytes, and the infecting organisms. The perivascular spaces of the cerebral cortex are early infected; the exudate here is of the same character as in the subarachnoid space. In the very virulent infections, the substance of the brain and cord may be involved as in similar processes in man.

It is of importance to determine whether the meningitis produced by intravenous inoculation and release of cerebrospinal fluid is the result of infection due to a possible leakage of blood along the track of the needle into the subarachnoid space. The evidence at the present time indicates most strongly that the determining factor in the infection is probably the pressure of the spinal fluid with associated vascular alterations. This conclusion is based in part on observations such as these:

(*a*) In the majority of cases, the exudate is largely cerebral and does not represent the characteristic distribution of a spread from a local point of infection.

(*b*) Cultures of the cerebrospinal fluid removed during the artificial septicemia and when free from blood contamination have proved negative.

(*c*) The withdrawal and replacement of the fluid, just before intravenous inoculation, have not resulted in the production of a meningitis though it is impossible to prevent leakage of the fluid outward along the path of the needle.

(*d*) Similar withdrawal of fluid during the septicemia, but replacement after two minutes, has not prevented the development of a meningitis.

In addition, other factors, to be reported later, argue strongly for the view that the infection of the meninges under such circumstances is the result of pressure alterations within the central nervous system.

PRODUCTION OF MENINGITIS SIMILARLY WITH OTHER ORGANISMS

With such results following the intravenous injection of *B. mucosus-capsulatus* with release of cerebrospinal fluid, experiments were undertaken to ascertain if the same procedure, but with other organisms, would produce meningitis. The difficulty has been that with the ordinary cultures in a laboratory, the intravenous toxicity is high compared to the intraspinal. However, it has been possible to repeat these experiments and confirm the finding on the cat with two other organisms—*B. pyocyaneus* and *B. paratyphosus* B. On rabbits a similar result has been obtained with a strain of streptococci procured from an army camp. Three control rabbits in one of these series were given intravenous doses of this organism, 1 c.c. each of a twenty-four hour broth culture, diluted 1:1,000, 1:2,000 and 1:5,000, respectively. Similar doses were given to three other rabbits of the same size and weight, but these were in addition each subjected to the release of about 1 c.c. of clear cerebrospinal fluid by occipito-atlantoid punctures. Two of the latter animals were dead on the next morning; at necropsy an acute meningitis was found. The third animal showed within twenty-four hours a more chronic form of meningitis, dying on the seventeenth day; typical infection of that duration was found postmortem. The three control animals remained normal until killed on the twenty-fifth day; the central nervous systems of these animals showed no abnormalities.

VIRULENCE AND NUMBER OF ORGANISMS

The biologic significance of the release of cerebrospinal fluid during an artificial septicemia seems established by the production, in this laboratory, of a typical meningitis with four different organisms. The conditions for the successful production of such an experimental meningitis concern two factors, both apparently of determining importance. In the first place, it seems established that the organism used must possess relatively great virulence within the meninges and be capable of multiplication there even when in small numbers. The strain of *B. mucosus-capsulatus* has best fulfilled this requirement when introduced into the subarachnoid space of the common laboratory mammals; its virulence in these animals is probably comparable to that of organisms causing meningitis in man. The other important condition deals with the number of organisms circulating in the blood stream at the time of the release of the spinal fluid; if this is not great enough, no infection will take place.

It must not be assumed from the statements made that a meningitis may not be produced by *B. mucosus-capsulatus* after simple intravenous injection. Such a meningitis has been caused by the introduction within the blood stream of massive doses of the organism. The amount necessary to produce such a meningitis is at least four to six times the customary intravenous injection; such animals are killed usually by the septicemia and not by the meningitis. Many of these animals died from the overwhelming intravenous injection without development, as shown by later necropsy, of any meningeal infection at all. With massive doses, however, all parts of the body may be infected: the meningitis is merely a part of the general infection. This bears only slight relation to the phenomenon of the localization of an intravenous infection within the meninges by release of cerebrospinal fluid.

CONCLUSION

It seems established, then, that the intravenous injection of a sufficient number of organisms, virulent within the meninges, will produce a typical leptomeningitis, if the cerebrospinal fluid is withdrawn during the artificial septicemia. The clinical significance of this finding seems great, and it becomes necessary to ascertain if the same relation between the withdrawal of cerebrospinal fluid during a septicemia and the subsequent development of a meningitis will hold in man. Data relating to this point are being assembled.

A STAIN FOR INFLUENZA BACILLI IN TISSUES

A COMBINATION OF GOODPASTURE'S AND WEIGERT'S STAINS *

W. G. MACCALLUM, M.D.
BALTIMORE

Since the bacillus of Pfeiffer commonly occurs in association with other organisms in the lungs and other tissues, it is difficult to make the organisms appear distinctly in stained sections. There are many methods by which they or any other gram-negative organisms can be stained in the tissues (Nicolle, Giemsa, etc.), but these require very careful differentiation and then leave all bacteria, whether gram-negative or gram-positive, stained alike. One may, of course, stain all bacteria in one section and only the gram-positive organisms in another, and subtract the result in one from that in the other, so as to gain an idea of the number and distribution of gram-negative organisms; but it is very desirable to be able to bring out in the same section the gram-negative bacteria in one color and the gram-positive in another.

The stain devised by Dr. Goodpasture furnishes the requisite red stain for all bacteria. This used alone gives results comparable with those of Giemsa's or Nicolle's method but is suitable for combination with Weigert's stain because of its contrasting color.

Dr. Goodpasture's paper giving his method will not be published until April, but he most kindly allows me to use his formula in describing the combination which includes his stain, "in view" (as he writes) "of the present need of such a method."

PROCEDURE

Fixation should be in Zenker formaldehyd solution, and very thin paraffin sections should be used.

1. Stain for from ten minutes to one-half hour or more in Goodpasture's stain, which is:

	Gm. or C.c.
30 per cent. alcohol	100
Basic fuchsin	0.59
Anilin	1.0
Phenol crystals	1.0

2. Wash in water.
3. Differentiate in 40 per cent. formaldehyd solution. This requires only a few seconds. The bright red color washes away and gives place to a clear rose.
4. Wash.
5. Counterstain in saturated aqueous picric acid. The section remains until it assumes a purplish yellow, about three to five minutes or less.
6. Wash in water.
7. Differentiate in 95 per cent. alcohol. The red reappears and some of it is washed out. Some of the yellow of the picric acid is also washed out.
8. Wash in water.
9. Stain in Stirling's gentian violet five minutes or more.
10. Wash in water.
11. Gram's iodin solution.
12. Blot dry without washing.
13. Anilin and xylene (equal parts) until no more color comes away.
14. Two changes of xylene.
15. Balsam.

Gram-negative organisms stain red, gram-positive blue. The tissues stain brilliantly in shades of red and purple. Fibrin is, of course, sharply stained, and the granules of mast cells are prominent as red or purplish coccus-like bodies.

The method should be useful in the study of infections of exposed surfaces, such as the intestinal mucosa and the urinary bladder, with gram-negative organisms. The lesions of dysentery, typhoid fever and many other similar conditions might be studied with advantage by this method.

* From the Johns Hopkins University.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

CHLORINATED EUCALYPTOL-SQUIBB.—Eucalyptol, chlorinated at ordinary (room) temperature.

Actions and Uses.—Chlorinated eucalyptol-Squibb is used as a solvent for dichloramine-T.

Dosage.—Solution of dichloramine-T in chlorinated eucalyptol-Squibb should preferably be made as required and without the use of heat. If kept in the dark, stock solutions may be used for thirty days.

Prepared by E. R. Squibb & Sons, New York. No. U. S. patent or trademark.

Eucalyptol is treated with potassium chlorate and strong hydrochloric acid. After standing twelve hours at room temperature, the chlorinated eucalyptol is washed, first with water and then with sodium carbonate solution. Dry sodium carbonate is then added to the chlorinated eucalyptol and this allowed to stand for twenty-four hours. The chlorinated eucalyptol is filtered and dried by addition of calcium chloride (JOUR. A. M. A., July 7, 1917).

Chlorinated eucalyptol has the color and odor of eucalyptol.

ARSPHENAMINE (See New and Nonofficial Remedies, 1918, p. 44).

Arsaminol.—A brand of arsphenamine.

Manufactured by the Takamine Laboratory Inc., New York, under U. S. patent Nos. 986,148 (March 7, 1911; expires 1928), 1,081,897 (Dec. 16, 1913; expires 1930), 1,081,592 (Dec. 16, 1913; expires 1930), and 1,116,398 (Nov. 10, 1914; expires 1931) by license of the U. S. Federal Trade Commission.

Arsaminol 0.1 Gm. Tubes.—Each hermetically sealed tube contains arsaminol 0.1 Gm.

Arsaminol 0.2 Gm. Tubes.—Each hermetically sealed tube contains arsaminol 0.2 Gm.

Arsaminol 0.3 Gm. Tubes.—Each hermetically sealed tube contains arsaminol 0.3 Gm.

Arsaminol 0.4 Gm. Tubes.—Each hermetically sealed tube contains arsaminol 0.4 Gm.

Arsaminol 0.5 Gm. Tubes.—Each hermetically sealed tube contains arsaminol 0.5 Gm.

Arsaminol 0.6 Gm. Tubes.—Each hermetically sealed tube contains arsaminol 0.6 Gm.

CHLORAMINE-T.—Sodium Paratoluenesulphochloramide. —$CH_3.C_6H_4.SO_2NaNCl+3H_2O$, 1:4.

Actions, Uses, Dosage, Physical and Chemical Properties.—See New and Nonofficial Remedies, 1918, p. 156.

Chloramine-T, Monsanto.—A brand of chloramine-T.

Manufactured by the Monsanto Chemical Works, St. Louis. No U. S. patent or trademark.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET . . . CHICAGO, ILL.

Cable Address . . . . "Medic, Chicago"

Subscription price . . . . . Five dollars per annum in advance

Contributors, subscribers and readers will find important information on the second advertising page following the reading matter

SATURDAY, JANUARY 18, 1919

THE VENOPRESSOR MECHANISM

In order to enable the heart to distribute a suitable modicum of blood to the tissues and organs, a corresponding quantity must be delivered to the cardiac pump for circulation. However obvious this may be to the critical student of hemodynamics, it has not received the recognition that such a fundamental fact requires from the casual observer of circulatory phenomena. The important factors in the diastolic filling of the heart that limit the volume of blood circulated in any unit of time are the venous pressure and the volume of the venous return of blood. The needs of different parts of the body for blood vary enormously at different times. Rest and vigorous muscular activity represent, for example, extremes of condition that determine widely unlike demands for blood distribution by the heart. Correspondingly enormous variations in the volume of venous blood return required and provided occur. Accordingly there must be some mechanism, to quote a recent writer,[1] controlling the supply of blood from the veins to the heart and regulating the variations needed during rest and exercise. This mechanism must adjust the venous pressure to dilate the right heart during diastole, neither over nor underfilling the ventricle.

How is the advantageous control of this admittedly essential venopressor mechanism brought about? A few years ago when the peripheral modification of blood flow was believed to be associated solely with changes in the caliber of the arterial system, an active as contrasted with a merely passive change in size of the smaller efferent vessels, the venules, was scarcely taken into account as a vasomotor possibility. Vasomotor control was almost synonymous with regulation of the arterial side of the circulatory cycle. Today we must admit that the capillaries and venules also may participate more actively in a change in caliber that will modify the possibility of the blood flow through them.

Recent studies are beginning to indicate the probability—if, indeed, they do not clearly demonstrate—that both nervous and chemical factors may contribute to vascular relaxation and change in the capillary and venous regions. Hooker[2] has recently demonstrated how a rise of venous pressure may be obtained quite independently of arterial factors, through responses of the venopressor mechanism, particularly by directing nervous influences on it. Perhaps even more significant and novel are the contributions of Henderson and Harvey[1] from the physiologic laboratory of the Yale School of Medicine, which suggest that the venopressor mechanism consists essentially in the chemical influence, either directly or through a local nervous mechanism, on the caliber of the capillaries and especially of the small efferent vessels, the venules, exerted by the greater or less venosity of the blood in and flowing from the organs, especially the skeletal muscles. The greater the activity of the muscles, the more venous this blood. The efferent vessels are thus relaxed and the outflow from the capillaries into the venous system made easier. The volume of the venous return to the heart is increased, the venous pressure is raised and (within certain limits) the efficiency of the heart is increased. Thus the two extremes of high venous pressure on the one hand and abnormally low venous pressure on the other are induced, respectively, the former by muscular exertion with great carbon dioxid production and the latter by acapnia and related conditions.

The demonstration of such a venopressor mechanism distinct from the traditional vasomotor nervous regulation—a mechanism consisting of a peripheral chemical control, largely through variations in the carbon dioxid content of the venous blood, over the venous pressure and the volume of the venous return—is founded on recently reported experiments.[1] Thus Henderson and Harvey found that procedures which strongly influence vasomotor innervation cause on the whole decidedly greater alterations of arterial than of venous pressure, and the alterations of venous pressure are often only momentary and therefore largely indirect and secondary to redistribution of blood. On the other hand, admittedly chemical changes that have little or no effect on arterial pressure, other than an increased amplitude of pulse, cause an enormous rise of venous pressure. Thus another instance is added to the growing evidences for chemical regulation of vital functions—in this case factors in the circulation "acting as a powerful accessory to the vasomotor nervous system in accelerating the venous return, and regulated by chemical rather than by nervous influences." If shock involves a fall of arterial pressure due to decreased venous return to the heart, the possible importance of the phenomena just discussed must become obvious. But this is a province of perennial debate that we hesitate to enter.

1. Henderson, Yandell, and Harvey, S. C.: Acapnia and Shock, VIII, The Venopressor Mechanism, Am. J. Physiol. **46**: 533, 1918.

2. Hooker, D. R.: The Venopressor Mechanism, Am. J. Physiol. **46**: 591, 1918.

PALEOPATHOLOGIC STUDIES

Paleopathology, as we have pointed out,[1] is a new word for a very old subject, which is only now beginning to attract the attention it deserves. All physicians interested in the scientific side of medicine, especially those who have professional and educational interests at heart, should be familiar with its recent progress. The term was originally proposed, we believe, by Ruffer in 1914, when, in the course of researches on ancient Egyptian mummies, he realized that the study of pathologic changes occurring in past ages ought to have a definite place of its own in medical science. Mummies have revealed the fact that pathology in its present form is as old as human history, and that bones particularly, but also arteries and other tissues, when preserved as the mummies have been, demonstrate that humanity has not changed in its pathologic reactions for fifty centuries at least. It is interesting to find arteriosclerosis affecting the Egyptians just as it does men of our time. It is illuminating to realize that in spite of the fact that the ancient Egyptians led lives of ease, had no tobacco, and did not overindulge in meat eating, their arteries degenerated practically in the same way as our own.

Keith,[2] in discussing the trephined skulls from the Neolithic graves in France, states that in one Neolithic sepulchral chamber accidentally discovered in 1908 on the side of a hill at Vendrest, about 60 miles east of Paris, remains of more than 120 individuals representing both sexes and all ages were found, and no less than eighty skulls had been trephined during life. Such skulls have been found elsewhere in France and also in England, some of them with more than one trephine opening. Manifestly, the operation was rather frequently done. The operations were performed not less than 4,000, and some of them perhaps 6,000 years ago, with stone instruments; for the use of metals had not as yet been learned. As the margins of the openings are healed over, the patients had recovered completely. It has been suggested that the operations may have been performed on patients suffering from various forms of insanity, with the idea of letting out a bad spirit. Something like this is needed to account for the frequency with which trephined skulls are found in certain places, and, if true, will afford a basis for some interesting reflections on insanity thus early in mankind.

The question of epidemics in the distant past may arise and find a more or less satisfactory answer in paleopathology. There seems no doubt now that tuberculosis can be traced in certain regulations of the Code of Hammurabi, about 2,000 B. C. Dr. John K. Mitchell (3d), at the Philadelphia museum, felt that he could trace definite signs of the occurrence of infantile paralysis in the mummy of a young prince of one of the early dynasties of Egypt, probably about 4,000 B. C. The presence of tsetse flies in the Oligocene of Colorado suggests the possibility of trypanosomiasis among the herds of the earliest animals in this country of which we know anything. It is possible that some of the huge animals of the early times, whose strength would seem to secure them a power of survival, disappeared not before the severity of changing climate or the attacks of smaller but more active animals, but before the insidious invasion of microorganisms, which literally swept them out of existence. Professor Conklin of Princeton, in his lectures on biology, reminds us that the great rule of history has been that "the mighty are put down from their seats, and those of low degree are exalted."

Paleopathology may very well prove capable of throwing light on practical problems of present day medicine, though of itself it is interesting because it extends the range of the history of medicine from that of human times into the very oldest periods. Physicians can scarcely help but realize how much of dignity is added to our everyday pathology, once we appreciate that pathologic changes similar to those that we study now can be found in the bones and other durable remains of old-time animals, literally thousands of generations ago and probably even hundreds of thousands of years before our era.

1. The Antiquity of Disease, Current Comment, J. A. M. A. 71: 1829 (Nov. 30) 1918; Prehistoric Surgery, editorial, J. A. M. A. 72: 42 (Jan. 4) 1919.

2. Keith, Arthur: The Antiquity of Man, Philadelphia, J. B. Lippincott Company, 1915.

INSECT-BORNE DISEASES AND THE WAR

Owing to the transport of troops to and from almost all parts of the world, the war has provided a ready means of conveying diseases, hitherto unknown, to various countries. This has been the case especially with tropical diseases, which in the past three years have occurred with more or less frequency in temperate climates, in France and England, for example. In some features, the war has resembled the Crusades in that during its continuance there has been a constant stream of large groups of men traveling backward and forward from eastern Europe and Asia to western Europe. There has been an increasing ingress into France, and to a considerably less extent, into England, of troops from nearly every part of Africa and the Orient; therefore the parasitic diseases that have been introduced in this manner cannot fail to have infected some of our men, and unless precautions are taken may be a menace to our civilian population.

Some of the maladies prevalent in hot climates already have been shown to be spread chiefly or largely by insects, and, of course, it is more than likely that insects are factors in the transmission of the majority of these infections. Mosquitoes and biting flies are responsible for some of the most deadly diseases, as malaria, yellow fever and sleeping sickness, while the

rat flea plays the most prominent part in the dissemination of plague. The mosquitoes *Stegomyia fasciata* and *Culex* and the sandfly *Phlebotomus perniciosus* are considered to be the vehicles whereby Mediterranean dengue is conveyed to man. Adrien[1] believes that the phlebotomus is the "carrier," mosquitoes acting only as possible transmitters. Cleland and Bradley,[2] describing an outbreak of dengue in Australia, give data that seem to show beyond a doubt that the virus of dengue in Australia is conveyed by *Stegomyia fasciata*, which undergoes some development in this insect. Indeed, according to these authors, the disease and its mode of transmission exhibit many points of resemblance to yellow fever. The body louse is rightly indicted as being largely concerned in the spread of typhus fever, and the same insect has been practically proved guilty of transmitting trench fever. In fact, this is apparently the important and common mode of transmission. Incidentally, it may be said that although the bedbug has been under suspicion for some time as an agent in the conveyance of certain infectious diseases, investigations undertaken thus far tend to clear it of the imputation.

The particular point which it is desired to emphasize is that the return of troops from Europe to this country is, to some extent, a source of danger to the general population. Diseases foreign to our shores may be brought into this country by returned soldiers, if great care is not taken, especially those introduced mainly by the agency of body lice. While it is obvious that with the cessation of hostilities the ridding of troops from body vermin can be considerably facilitated, the actual danger of spreading disease by lice may not be greatly minimized. Disinfection may not be so thoroughly carried out as in time of war, and it is by no means improbable that demobilized soldiers on their return to America may carry infected lice on their bodies or on their clothes. Moreover, there seems to be little doubt that on the American troops will fall the duty of performing some of the policing of Europe. They may be stationed in the Balkans, in parts of Russia and in the Central Empires, in some of which countries conditions favorable to the contraction of insect-borne diseases, and of lice-borne diseases in particular, exist. On the borders of Serbia it needs only a spark to start a conflagration of typhus fever, and the only methods of preventing such a calamity, in which, if extraordinary precautions are not taken, the troops might participate, are to exterminate the body lice so far as is possible. It must be borne in mind that in order to prevent typhus fever or trench fever, or, at any rate, to limit their spread among troops, the best efforts must be put forth to keep soldiers from infestation with lice. There is another point to which attention may be drawn: It is thought to be possible to disseminate trench fever by the agency of urine and sputum, both of which become infected and presumably may remain infected for a considerable length of time. Therefore it seems advisable that urine and sputum of returned soldiers who have been subjected to infestation by lice should be sterilized. If it may appear somewhat far fetched to suggest that troops returned from Europe may infect the civilian population with parasitic diseases, it remains to be said that parasitic diseases have occurred among the white population of France and England imported by troops from the Orient, Africa or eastern Europe. In existing circumstances, it is wise to err on the side of caution, and every conceivable step should be taken to protect the soldiers from infection by insect-borne diseases and to safeguard the inhabitants of this country from the spread of similar diseases introduced by the returned soldier.

1. Adrien, Charles: Arch. de méd. et pharm. nav. **105**: 275 (April) 1918.
2. Cleland, J. B., and Bradley, B.: J. Hyg. **16**: 317 (Jan.) 1918.

SURVEY OF CRIPPLES IN CLEVELAND

One of the good results of the war has been a stimulation of interest in the physically handicapped, in cripples of whatever degree of incapacity. Systematic efforts are being made to devise apparatus, occupations and methods of training that will enable the cripple to remain or become self-supporting. One evidence of this interest is the report on the education and occupations of cripples based on a survey of cripples in Cleveland. It is compiled by the Welfare Federation of Cleveland and published by the Red Cross Institute for Crippled and Disabled Men of New York City. In spite of our boasted progress, public sentiment in most of our cities has become hardened to the spectacle of the lame beggar or the crippled shoestring merchant or lead-pencil vender. A survey, establishing the exact amount of dependency due to this cause, is a valuable contribution to our knowledge in a field in which accurate data are lacking. With the exception of the Massachusetts census report for 1905, little attention has been given to this subject, so that the Cleveland survey is not only the first census of the cripples of a city that has been taken but is also the most comprehensive and analytic study of its kind ever undertaken. A house-to-house canvass, involving visits to 150,000 families, revealed 4,186 persons physically defective, crippled or incapacitated to such an extent as to place them within the limits of the definition adopted by the committee. In a similar census in Birmingham, England, in 1911, the definition adopted was: "a person whose muscular movements are so far restricted by accident or disease as to affect his capacity for self-support." The Cleveland committee found it advisable to modify this double physical and economic qualification so as to make the census include all persons physically handicapped, without regard to their economic condition. Taking the estimated population

of Cleveland for 1916 as 674,073, the estimated ratio of cripples is 6 cripples to each 1,000 inhabitants. This tallies very closely with the results of the Massachusetts census, which gave 5.7 per thousand. Of the 4,186 cripples found, 2,638 were male and 1,548 female. Grouped by ages, 936, or 22 per cent., were less than 15 years of age; 2,553, or 61 per cent., were between the ages of 15 and 60, and 697, or 17 per cent., were over 60 years of age. Two thousand and forty-six, or nearly one half of the total number, became crippled before they were 15 years of age; 1,820, or 43 per cent., became crippled during the priod of active working life, that is, between 15 and 60, while only 273, or 6 per cent., became crippled after the age of 60 years. Regarding the form and degree of incapacity, 735, or 17 per cent., lost arms or portions of arms; 2,404, or 58 per cent., lost legs; 332, or 8 per cent., lost one or both arms or one or both legs; 272, or 6 per cent., had deformity or paralysis of the body, and 443, or 11 per cent., disability of arms or legs, or of both arms and legs and of body. The causes of disability are: congenital, 301; occupational accidents, 468; other accidents, 1,323; infantile paralysis, 525; other diseases, 1,437; not stated, 132. Occupational accidents, most of which were preventable, and infantile paralysis, a preventable contagious disease, are together responsible for 993, or 25.72 per cent., while crippling due to accidents and diseases of all kinds amount to 3,753, or 89.65 per cent. Infantile paralysis alone is responsible for one eighth of all the cripples and for 41 per cent. of the crippled children. Tuberculosis caused 15 per cent. of the crippling among children.

For obvious reasons, the percentage of illiterates was high. Three hundred and forty-seven under 9 years of age were not attending school; 282 cripples over 10 years of age were illiterate. The figures regarding employment are gratifying: Out of 3,250 persons over 15 years of age, 1,912, or 59 per cent., were employed in spite of the handicap of their physical condition, while 1,338, or 41 per cent., were not employed. Wages for crippled persons employed range from $6 to $50 a week, the largest number being in the $10 to $15 a week class; 1,743 are earning a living, and more than half of these are earning a living not only for themselves but also for others. Of those supported by other means than work, 1,034 out of the total of 1,418 are supported by their families, 136 by income, and 125 by relief agencies; fifty-six are in receipt of industrial pensions. Of 593 females at work, 400, or 67 per cent., are active housekeepers. Of the sixty occupations followed by four or more crippled men, the largest group were unskilled workmen or those doing work not dependent on muscular activity. The report, which contains many tables and much interesting data, as well as personal sketches and the histories of selected cases, concludes with recommendations for the reduction of crippling diseases and accidents and the better care of persons already disabled.

The survey and report form a most commendable piece of constructive work. Far too much of our public health energy heretofore has been expended in work that was largely sentimental and nonproductive. The first requisite for the improvement of any condition is an accurate knowledge of all the facts pertaining to that condition. In too many instances in the public health field, our knowledge is fragmentary, vague and unsystematic. The method that has produced results in scientific circles must be followed in the public health field: careful, painstaking, detailed study of small sections of the field, gradual extension of knowledge, and final grouping of all available data into a generalized whole. To this end, the Cleveland survey is a praiseworthy contribution.

Current Comment

OUR FOREIGN EXCHANGES IN 1918

Notwithstanding the censor and the U-boats, the foreign language exchanges have been received with great regularity so that the file for 1918 is complete to date for nearly all, and they have been duly indexed. They arrived sometimes far out of chronological order, but as months passed this condition righted itself. No Russian journals of any kind were received during 1918, and of course no journals from Germany or Austria. But the German language was represented, as the *Correspondenz-Blatt für Schweizer Aerzte*, of Basel, Switzerland, and one other of the three Swiss journals listed, and some of the five Japanese exchanges are published in German. The aspect of the French and Italian journals of 1918 with their blank or effaced advertising pages is of historical interest. The scarcity of paper is shown by the smaller number of pages and the quality of the paper. Italy seems to have suffered most in the latter respect; the four weeklies are printed on very poor paper. The *Riforma Medica* looks, indeed, as if it "had been through the war," as the large size of its page, 10 by 14 inches, and the consequent folding of the paper to mail it, give it a dilapidated air even when first received. The *Policlinico* in its compact 7 by 10 page keeps its shape perfectly, but a recent editorial in this important weekly stated that "paper which before the war cost 40 or 50 lire a hundredweight now costs from 350 to 400 lire, and is of such poor quality that in normal times we would not accept it as a gift." The journals of South and Central America, Mexico and the West Indies show no appreciable evidence of the scarcity of paper, although all our exchanges complain of the high price. The 1918 file is complete to date for our three Swedish exchanges, the one Norwegian monthly, the two Danish weeklies, and the four Portuguese journals from Brazil. Nine Italian journals are complete with the exception of one copy of the *Policlinico*. Two of the twenty-one French exchanges lack a few

numbers, as also two of the eight exchanges from Spain and four of the twenty-eight received from South and Central America, Mexico and the West Indies. Thus only nineteen numbers failed to reach us of eighty-three foreign language exchanges, regularly indexed, while the greatest war in history was being waged, with diabolical efforts to arrest all ocean traffic, including the mails.

A HEALTH ALMANAC FOR MINERS

Some years ago a number of state health officials, impressed with the value of the old-fashioned almanac as a cherished and frequently consulted household guide, objected to the apparent monopoly of this medium by the "patent medicine" interests. They saw no reason why an almanac could not be made a messenger of health instead of an advance agent for somebody's green pills. Accordingly, health almanacs were issued by a number of our state health departments, apparently with good results. The Bureau of Mines of the Department of the Interior has followed the same plan in issuing Miners' Circular 24, a miners' safety and health almanac for 1919. It is published in cooperation with the United States Public Health Service. The usual and familiar monthly tables are interspersed with reading matter, offering good advice to the miner regarding his health and safety. The table of contents shows that a majority of the subjects are health topics, such as pneumonia, smallpox, drinking water, sore eyes in new-born babies, pellagra, flies, mosquitoes, garbage, typhoid, "patent medicines," and the care of the teeth. Other articles relate to safety, under such headings as responsibility of the miner, ten commandments to prevent accidents, mechanical safeguards, methods of making coal dust harmless, precautions in a gaseous mine, mine rescue apparatus, and explosives used in mining. The calendar, in place of the familiar historical events, contains a health or safety fact or warning for each day. The reading matter is attractively and interestingly written, and illustrations and diagrams abound. This effort to teach health and industrial safety to miners through an old and familiar medium is worthy of imitation in other occupations.

HEREDITARY TENDENCY TO FORM CERTAIN TUMORS

The part played by heredity in the incidence of a not inconsiderable number of diseases has come to be recognized as an indisputable factor in the study of their causation. The tendency to form vascular tumors of the skin and mucous membranes, pigmented patches in the skin, and polyadenomas, for example, is now believed to be a dominant trait, as the student of genetics terms it. Dr. Charles B. Davenport[1] of the Carnegie Institution's Station for Experimental Evolution believes that to this group of heredity belong also epidermolysis bullosa, angioneurotic edema, and persistent hereditary edema, and such skin diseases as psoriasis, porokeratosis and ichthyosis. Recently he has secured the statistical evidence which demontrates that the rather rare condition known as multiple neurofibromatosis represents a similar hereditary tendency. It is reported that despite the rarity of the malady there are many cases in the literature in which from two to six members of the family show some of the symptoms. From the fact that only blood relatives are affected, Davenport adds that the disease is not a communicable one, and it is equally certain that it is not induced by infection through the placenta. The two sexes are nearly equally apt to be affected—of 243 affected persons, 56.8 per cent. are males. The disease tends to recur without a break in the generations, and is equally apt to come down the male and the female line. Consequently it looks as though the hereditary factor in neurofibromatosis is a dominant one. Modern experimental studies on the spontaneous occurrence of tumors in laboratory animals have given much support to the prominence of the hereditary factor in the problem that they present. Davenport states that in not a few cases the removal of neurofibromas in man has been followed by the appearance of malignant growths at the same spot. As neurofibromas, which thus seem to be related to cancerous growths, have an inheritable basis, it is suggested that the alleged association of cancers in general with such a hereditary factor is further strengthened.

1. Davenport, C. B.: Hereditary Tendency to Form Nerve Tumors, Proc. Nat. Acad. Sc. 4: 213, 1918.

INDIANA GOVERNOR'S HEALTH RECOMMENDATIONS

It is to be expected that each year will show increased interest in constructive health legislation on the part of state executives. This naturally growing interest has been augmented by the prominence given to health questions through problems arising out of the war. It is not surprising, therefore, but rather an evidence of progress in conformity with the spirit of the times, that Governor Goodrich of Indiana should devote a considerable amount of space to health topics in his message to the General Assembly. "It is the first duty of the state," he says, "to do everything possible to conserve the health, the physical and moral well-being of our people. It has been demonstrated that our public health laws are inadequate to meet the situation. The revelations of the draft examinations are convincing. Not only has a large proportion of our young men been pronounced unfit for service and rejected on the initial examination, but as the further sifting process has been continued, it has been ascertained that at least one-third of the young men of the country were unfit for service. . . . Physical education is as necessary to the development of our young people as mental training. . . . Our educational system should be so organized as to provide for compulsory physical education of our young people." As a practical recommendation for better health conditions in the state, the governor indorses the movement for all-time health officials. This indorsement should be of great assistance to the state board of health in its efforts to secure whole-time town and county health officials. The governor also discusses the rural school question from a health standpoint, basing his recom-

mendations on the surveys and reports made by the Federal Commissioner of Education and the National Education Association, in cooperation with the American Medical Association. While admitting a just pride in the work and accomplishments of the rural schools of Indiana, he urges on the legislature that much remains to be acomplished for the improvement of sanitary and health conditions among rural schoolchildren and recommends careful consideration of the problems involved. Governor Goodrich's message is a gratifying evidence of the growing interest taken in health problems by our most progressive state executives. With such a governor progress in health matters in Indiana should be rapid.

Association News

THE ATLANTIC CITY SESSION

Governmental Status Given the Victory Meeting Through Approval of the Secretary of War

As already announced, the annual session to be held next June will be a "victory" meeting. One of the special features will be the bringing together of medical representatives of the allied governments associated in the world war to plan for cooperative interallied study and research, to discuss methods for taking advantage of the advances in medical science that have developed because of the war, and to cement the bonds of an enduring friendship among medical men. The following correspondence relates to the subject:

Washington, D. C., Dec. 23, 1918.

My dear Mr. Secretary:

The annual meeting of the American Medical Association will be held at Atlantic City, N. J., from June 9 to 13, 1919. It has a membership of more than 80,000 physicians and surgeons. Approximately 40,000 of its members have served in the Medical Department of the Army during the world war. The annual meeting at Atlantic City will be called a victory meeting of the American Medical Association.

It is desired by the leading members of the medical profession of this country to make this victory meeting a notable one, and that representative medical men of all of the allied governments associated in the world war may be invited to attend the meeting for the purpose of conference on and compilation of the knowledge of medical science growing out of the war.

That these invitations to the foreign representatives may have something of an official character, it is requested that the invitations may be sent by the officers of the American Medical Association under the patronage of the Medical Department of the Army of the United States.

No expense to the United States government is implied in this suggestion. Attached hereto is a memorandum for your signature if the proposition meets your approval.

Very sincerely yours,

(Signed) M. W. IRELAND,
Surgeon-General, U. S. Army.

To the Honorable Newton D. Baker,
Secretary of War.

Dec. 23, 1918.

The American Medical Association is authorized, under the patronage of the Medical Department of the Army of the United States, to invite medical representatives of the allied governments associated in the world war to the annual victory meeting to be held at Atlantic City, New Jersey, from June 9 to 13, 1919.

(Signed) NEWTON D. BAKER.

The approval of the Secretary of War gives the session of the Association a governmental status. The Board of Trustees has appointed and empowered the following committee to act for the Association in inviting these delegates: Arthur Dean Bevan, President; Alexander Lambert, President-Elect; Alexander R. Craig, Secretary; Merritte W. Ireland, Surgeon-General of the U. S. Army; William C. Braisted, Surgeon-General of the U. S. Navy; William H. Welch and William J. Mayo, Ex-Presidents; and the following members of the Board of Trustees: Philip Marvel, Wendell C. Phillips, D. Chester Brown and Frank Billings, the last mentioned being chairman of the committee.

ALEXANDER R. CRAIG, Secretary,
American Medical Association.

Medical Mobilization and the War

Personnel of the Medical Corps

For the week ending January 10, there were in the Medical Reserve Corps 626 officers. This personnel includes forty-eighty majors, eighty-seven captains and 491 lieutenants. There were in the regular Medical Corps 26,017, a decrease of 1,597 since the previous week. Discharges to date include 8,194 officers.

Awards for Bravery

The Commander in Chief, in the name of the President, has awarded the Distinguished Service Cross to the following named officers of the medical department:

Lieut. ROBERT H. MURDOCH, deceased, Medical Corps, 47th Infantry. For repeated acts of extraordinary heroism in action at Sergy, France, July 29-31, 1917; and at St. Thibaut, France, August 6-12, 1918. Accompanying his battalion in the attack on Sergy, Lieutenant Murdoch advanced for more than a mile under heavy shell fire, and as soon as the southern half of the town had been taken he established his dressing station, maintaining it during the three days of fighting under constant and severe bombardment. When his battalion went into action at St. Thibaut this faithful officer again displayed heroic devotion to duty by working in his dressing station under the most trying conditions for six days while the town was bombarded with gas and high explosive shells.

Major JACKSON S. LAWRENCE, Medical Corps, 368th Infantry. For extraordinary heroism in action at Binarville, France, Sept. 30, 1918. Major Lawrence, with two soldiers, voluntarily left shelter and crossed an open space 50 yards wide, swept by shell and machine gun fire, to rescue a wounded soldier whom they carried to a place of safety.

Lieut. JOHN F. DOUDNA, Lake City, Mich., Medical Corps, 362d Infantry. For extraordinary heroism in action. This officer was under constant shell fire with his battalion for 17 days, and though he had been painfully wounded by a machine gun bullet, he remained at his post rendering first aid to the wounded night and day, performing the duties of two other medical officers, who had been incapacitated, in addition to his own. Lieutenant Doudna's utter disregard for personal danger and complete devotion to duty made possible the rapid evacuation of the wounded, thus materially keeping up the morale of the combat troops and alleviating the suffering of the wounded.

Lieut. ROSS E. WEAVER, Medical Corps, 102d Infantry. For extraordinary heroism in action at Marcheville, Sept. 26, 1918. Lieutenant Weaver showed complete disregard of personal safety by remaining with the foremost elements and administering aid to the wounded throughout the day under constant artillery bombardment and direct machine gun and rifle fire from the enemy.

Lieut. CHARLES W. COMFORT, New Haven, Medical Corps, 102d Infantry. For extraordinary heroism in action at Seicheprey, France, April 20, 1918. Lieutenant Comfort administered first aid for 36 hours, without rest or relief, to numerous wounded in the open, almost constantly under heavy artillery fire, and assisted in their evacuation, thereby setting an example of heroic performance of his duties under the most trying circumstances. A bronze oak leaf is awarded to Lieutenant Comfort for the following act of extraordinary heroism: On Sept. 26, 1918, near Marcheville, France, he displayed the highest courage and devotion to duty, being continually present on the front line administering first aid to the wounded under violent artillery and machine gun fire.

Lieut. JOSEPH H. DUNN, 101st Sanitary Train. For extraordinary heroism in action near Marcheville, France, Sept. 25-26, 1918. Lieutenant Dunn assisted in establishing and maintaining an ambulance dressing station in an advanced position, where he labored heroically dressing and evacuating the wounded in full view of the enemy, under constant heavy bombardment by the enemy.

Lieut. HENRY E. CHRISTIANSEN, Chicago, Ill., Medical Corps, 101st Ambulance Company. For extraordinary heroism in action at Saulx, France, Sept. 25-26, 1918. Lieutenant Christiansen established and operated a dressing station in an advanced position under constant heavy bombardment by the enemy. When word was received that our troops were withdrawing and permission had been given to move his station to a safer position he declined to withdraw, but continued his work of ministering to the wounded.

Specialized Treatment for the Wounded

In order to furnish specialized treatment for the wounded Surgeon-General Ireland has issued instructions to commanders of hospitals that special care be taken to provide specialists for treatment of various types of wounds. In addition arrangements have been made for the sending of certain classes of patients to specific hospitals where special facilities for treatment are provided. The following items are taken from a list recently published:

Blindness (or near blindness).—General Hospital No. 7, Roland Park, Md.

Deafness (total or near total).—General Hospital No. 11, Cape May, N. J.

Insane (officers).—General Hospital No. 1, Williamsbridge, N. Y.

Insane (officers and enlisted men).—Walter Reed General Hospital, Takoma Park, D. C.; Letterman General Hospital, San Francisco; General Hospital No. 4, Fort Porter, N. Y.; General Hospital No. 6, Fort McPherson, Ga.; General Hospital No. 13, Dansville, N. Y. (no violent, suicidal or homicidal cases); General Hospital No. 25, Fort Benjamin Harrison, Ind.; General Hospital No. 26, Fort Des Moines, Iowa;

General Hospital No. 28, Fort Sheridan, Ill.; General Hospital No. 34, East Norfolk (Pondville), Mass.; base hospital, Fort Sam Houston, Tex.

Maxillofacial (injuries of face and jaw).—Walter Reed General Hospital, Takoma Park, D. C.; General Hospital No. 2, Fort McHenry, Md.; General Hospital No. 11, Cape May, N. J.

Speech defects (which are not neurotic).—General Hospital No. 11, Cape May, N. J.

Neuroses (functional) drug addicts and inebriates.—General Hospital No. 30, Plattsburg Barracks, N. Y.

Epileptics and mental defectives.—Walter Reed General Hospital, Takoma Park, D. C.; Letterman General Hospital, San Francisco; General Hospital No. 1, Williamsbridge, N. Y.; General Hospital No. 6, Fort McPherson, Ga.; General Hospital No. 25, Fort Benjamin Harrison, Ind.; General Hospital No. 26, Fort Des Moines, Iowa; General Hospital No. 28, Fort Sheridan, Ill.; General Hospital No. 29, Fort Snelling, Minn.; base hospital, Fort Sam Houston, Tex.

Tuberculosis, pulmonary.—General hospital, Fort Bayard, N. M.; General Hospital No. 8, Otisville, N. Y.; General Hospital No. 16, New Haven, Conn.; General Hospital No. 17, Markleton, Pa.; General Hospital No. 18, Richland (Waynesville), N. C.; General Hospital No. 19, Oteen (Biltmore), N. C.; General Hospital No. 20, Whipple Barracks, Ariz.; General Hospital No. 21, Denver.

Amputations (lower extremities only).—General Hospital No. 3, Colonia (Rahway), N. J.

Amputations (for amputations fingers and toes, see General surgery).—Walter Reed General Hospital, Takoma Park, D. C.; Letterman General Hospital, San Francisco; General Hospital No. 6, Fort McPherson, Ga.; General Hospital No. 10, Boston; General Hospital No. 26, Fort Des Moines, Iowa; General Hospital No. 29, Fort Snelling, Minn.

Arthritis, chronic (nontraumatic).—Letterman General Hospital, San Francisco; Walter Reed General Hospital, Takoma Park, D. C.; General Hospital No. 6, Fort McPherson, Ga.; General Hospital No. 9 (ambulant cases only), Lakewood, N. J.; General Hospital No. 10, Boston; General Hospital No. 26, Fort Des Moines, Iowa; General Hospital No. 28, Fort Sheridan, Ill.

Wounds or injuries of the skull or brain (including traumatic epilepsy) and injuries or diseases requiring surgical treatment of importance of eye, ear, nose and throat.—Walter Reed General Hospital, Takoma Park, D. C.; Letterman General Hospital, San Francisco; General Hospital No. 2, Fort McHenry, Md.; General Hospital No. 11, Cape May, N. J.

Wounds or injuries of the spinal cord and organic disease of nervous system.—Walter Reed General Hospital, Takoma Park, D. C.; Letterman General Hospital, San Francisco; General Hospital No. 2, Fort McHenry, Md.; General Hospital No. 3, Colonia (Rahway) N. J.; General Hospital No. 6, Fort McPherson, Ga.; General Hospital No. 11, Cape May, N. J.; General Hospital No. 28, Fort Sheridan, Ill.; General Hospital No. 29, Fort Snelling, Minn.

Peripheral nerve injuries and paralyses (including healed or unhealed wounds, with or without fracture).—Walter Reed General Hospital, Takoma Park, D. C.; Letterman General Hospital, San Francisco; General Hospital No. 1, Williamsbridge, N. Y.; General Hospital No. 2, Fort McHenry, Md.; General Hospital No. 3, Colonia (Rahway), N. J.; General Hospital No. 6, Fort McPherson, Ga.; General Hospital No. 11, Cape May, N. J.; General Hospital No. 26, Fort Des Moines, Iowa; General Hospital No. 28, Fort Sheridan, Ill.; General Hospital No. 29, Fort Snelling, Minn.

Orthopedic cases.—(1) Deformities of extremities due to or associated with contractures of muscles, ligaments and tendons; (2) derangements and disabilities of joints, including articular fractures; (3) deformities and disabilities of the feet; (4) cases requiring tendon transplantation.—Walter Reed General Hospital, Takoma Park, D. C.; Letterman General Hospital, San Francisco; General Hospital No. 1, Williamsbridge, N. Y.; General Hospital No. 2, Fort McHenry, Md.; General Hospital No. 3, Colonia (Rahway), N. J.; General Hospital No. 6, Fort McPherson, Ga.; General Hospital No. 9, Lakewood, N. J. (ambulant cases only); General Hospital No. 10, Boston; General Hospital No. 26, Fort Des Moines, Iowa; General Hospital No. 28, Fort Sheridan, Ill.; General Hospital No. 29, Fort Snelling, Minn.; General Hospital No. 36, Detroit; General Hospital No. 39, Long Beach, Long Island, N. Y.

General medical cases and general surgical cases will be treated in all the cantonment base hospitals and in most of the general hospitals.

HONORABLE DISCHARGES, MEDICAL CORPS, U. S. ARMY

NOTE.—In the following list, L. signifies lieutenant; C., captain; M., major; L. C., lieutenant-colonel, and Col., colonel.

ALABAMA

Center—Tatun, S. C. (C.)
Loachapoka—Langley, O. V. (L.)
Montgomery—Baker, J. N. (M.)

ARIZONA

Globe—Kirmse, A. (L.)
Tucson—Thomas, C. A. (C.)

ARKANSAS

Bodcaw—Garner, W. M. (L.)
Clarksville—Manley, R. N. (L.)
De Queen—Kitchens, C. E. (L.)
Fort Smith—Johnson, J. E. (L.)
Haynes—Haynie, W. K. (L.)
Hope—Russell, M. V. B. (L.)
Hot Springs—Sanders, T. E. (L.)
Huntsville—Youngblood, F. (L.)
Little Rock—Bond, S. P. (L.)
Horner, E. J. (L.)
Marked Tree—Baird, J. L. (L.)
Newport—Watson, E. L. (C.)
Paragould—Baker, E. S. (L.)
Springdale—Martin, J. E. (C.)
Varner—Thiolliere, A. C. (C.)
Wilmar—Butler, E. D. (L.)
Harris, S. (L.)

CALIFORNIA

Gardena—Leake, N. A. (L.)
Linda Vista—Jones, J. P. (L.)
Los Angeles—McClish, C. L. (C.)
Mellman, C. (L.)
Sweet, E. B. (C.)
Pomona—Smith, R. T. (C.)
Sacramento—Arbogast, J. L. (C.)
Twitchell, E. W. (C.)
San Diego—Wegeforth, H. M. (C.)
San Francisco—Hillyer, F. M. (C.)
San Jose—Van Dalsen, S. B. (C.)
Santa Cruz—Piper, H. E. (C.)
Saratoga—Hogg, R. L. (L.)

COLORADO

Blanca—Soland, L. W. (L.)
Colorado Springs—Marbourg, E. M. (C.)
Denver—Hossler, W. H. (L.)
Shafer, H. S. (L.)
Lafayette—Braden, J. M. (C.)
Telluride—Washburn, F. L. (C.)
Trinidad—Espey, J. G. (C.)

CONNECTICUT

Bridgeport—Beck, M. C. (L.)
Finkelstone, B. B. (L.)
Hartford—Griggs, J. B. (C.)
Sagarino, J. F. (L.)
Litchfield—Deming, N. L. (M.)
New London—Black, R. E. (C.)
North Haven—Nichols, R. W. (L.)

DISTRICT OF COLUMBIA

Washington—Garnett, A. Y. P. (C.)
Kemble, A. (M.)

FLORIDA

Jacksonville—Bowen, F. J. (C.)
Lakeland—Maynard, B. H. (C.)
Springdale—Farnell, W. W. (L.)

GEORGIA

Atlanta—Elkin, A. (L.)
Fuller, G. W. (L.)
Huguley, G. P. (C.)
Hutchins, M. B. (C.)
Savannah—Myers, W. H. (C.)
Statesboro—Mooney, A. J. (C.)
Whitesburg—Beason, L. (L.)

IDAHO

Boise—Stewart, J. L. (C.)
Filer—Newberry, A. A. (L.)
Hailey—Dutton, H. H. (L.)
Mackay—Farrell, N. H. (L.)
Orofino—Fairly, J. M. (C.)
Rexburg—Espe, G. G. (L.)

ILLINOIS

Ashmore—Andrews, P. K. (L.)
Aviston—Reinhardt, O. F. (L.)
Beecher City—Brooks, E. W. (C.)
Canton—Zeigler, W. T. (C.)
Chicago—Bacon, W. H. (L.)
Blitzen, N. L. (L.)
Boddiger, C. E. (C.)
Bosler, A. G. (C.)
Bracken, G. F. (C.)
Britton, J. (M.)
Conroy, T. F. (C.)
Devine, E. J. (L.)
Ellis, J. W. (C.)
Felsher, W. Z. (L.)
Graves, R. E. (C.)
Grotowski, L. (L.)
Jeffries, W. G. (L.)
Kelley, M. J. (L.)
Kuhn, L. F. (C.)
Moore, J. H. (L.)
Napheys, W. D. (C.)
Penchina, M. (L.)
Sachtleben, C. G. (L.)
Schmaer, C. H. (L.)
Schuster, S. (C.)
Sempill, R. A. (C.)
Skembare, E. C. (L.)
Smith, G. T. (C.)
Stanton, J. E. (C.)
Wilson, J. P. (L.)
Wood, C. A. (L. C.)
Danville—Scott, I. J. (C.)
De Soto—House, O. (L.)
East St. Louis—Hulick, G. O. (L.)
Spanagel, W. C. (L.)
Freeport—Grant, J. J. (L.)
Genesee—Parsons, A. (C.)
Girard—Foote, C. H. (L.)
Hidalgo—Vanatta, C. L. (L.)
Hinsdale—Hoffman, E. H. (C.)
Joliet—King, H. T. (L.)
Joppa—Roberts, T. W. (L.)
Lacon—Bradford, A. (C.)
La Moille—Crede, E. H. (C.)
Leland—Moorhead, A. C. (L.)
Lostant—Schoenneshoefer, W. (C.)
Louisville—Campbell, G. W. (L.)
Dillman, J. V. (C.)
Matherville—Murrell, C. M. (L.)
McLeansboro—Johnson, J. A. (L.)
Moline—Bennett, H. S. (C.)
Nashville—Vernor, R. C. (L.)
Pleasant Hill—Goodman, J. E. (L.)
Pleasant Plains—Fink, F. C. (L.)
Richmond—Foster, W. E. (L.)
Ridgeway—Murphy, J. C. (L.)
Rockford—Catlin, S. R. (C.)
Shabbona—Moore, P. B. (L.)
Shelbyville—Hulick, C. H. (L.)
Shumway—Lorton, S. C. (L.)
Sigel—Heuck, H. H. C. (L.)
Springfield—Lockie, G. D. (L.)
Sycamore—Bell, F. H. (L.)
Vienna—McCall, T. E. (C.)
Washington—Gott, W. A. (C.)
Westville—Brownstein, S. W. (L.)
Wyanet—Herrick, R. E. (L.)
Xenia—Campbell, C. S. (L.)

INDIANA

Cates—Stackhouse, F. (L.)
Edwardsport—Scudder, J. A. (L.)
Elizabethtown—Jackson, C. M. (L.)
Emison—Hodges, W. A. (L.)
Evansville—Coleman, W. H. (C.)
Fairmount—Aldrich, H. (L.)
Fontanet—Newlin, E. O. (L.)
Gary—Skeen, E. D. (L.)
Greencastle—Lemmon, B. E. (L.)
Hartford City—Hollis, W. A. (L.)
Indianapolis—Brown, B. A. (C.)
Culloden, W. G. (C.)
Leonard, H. S. (L.)
Long, W. H. (L.)
Pape, E. A. (L.)
Terrell, B. J. (C.)
Jonesboro—Lucas, P. H. (L.)
Kokomo—Johnson, O. M. (L.)
Kurtz—Kern, F. W. (L.)
Lawrenceburg—Smith, G. F. (L.)
London—McDonald, O. H. (L.)
New Castle—Wiggins, D. S. (C.)
Ninevah—Lind, H. G. (L.)
Pendleton—Martindale, H. C. (L.)
Portland—Moran, M. M. (L.)
Rockville—Collings, T. J. (L.)
South Bend—Dehey, T. J. (C.)
Shanklin, R. C. (C.)
St. Paul—Hodges, V. L. (L.)
Versailles—Purdum, H. D. (C.)
Terre Haute—Fortune, J. L. (L.)
Union City—Zeller, F. A. (C.)
Warsaw—Howard, C. N. (C.)
Washington—Boner, G. W. (C.)
Whitestone—Little, W. D. (L.)
Williamsburg—Griffis, V. C. (L.)
Zanesville—McBride, J. L. (C.)

IOWA

Arthur—Patterson, S. T. (L.)
Cedar Rapids—Krejsa, O. (C.)
Centerville—James, C. S. (C.)
Charles City—McBeil, B. F. (L.)
Clarinda—McNews, R. T. (L.)
Columbus Junction—Miller, R. R. (L.)
Council Bluffs—Benjamin, H. P. (L.)
Cleaver, G. D. (L.)
Dallas Center—Glew, P. B. (L.)
Des Moines—Brinkman, W. F. (L.)
Harnagel, E. J. (C.)
La Piana, F. (C.)
Morden, R. R. (C.)
Prather, R. W. (L.)
Dubuque—Keogh, J. V. (C.)
Fairfield—Myrick, E. G. (L.)
Fort Dodge—Dorsey, T. J. (L.)
Fremont—Gillett, F. A. (L.)
Goodell—Snearly, G. E. (L.)
Gowrer—Lundvick, A. W. (L.)
Grinnell—Talbott, E. C. (C.)
Hawkeye—Wade, T. N. (L.)
Hull—Maris, G. (L.)
Iowa City—Morton, M. T. (L.)
Ireton—McCaughan, T. E. (C.)
Logan—Kennedy, C. S. (C.)
Lorimer—Eyres, E. C. (C.)
Monona—Tinker, F. E. (L.)
Mystic—Labagh, N. W. (L.)
Nora Springs—Henely, E. (C.)
Parkerburg—Hobson, T. A. (L.)

KANSAS

Benedict—Riley, B. R. (C.)
Bennington—Hinshaw, L. M. (L.)
Caney—Bigelow, G. (L.)
Chanute—Barker, J. W. (L.)
Corning—Davis, W. L. (L.)
Coyville—Henderson, L. E. (L.)
Cullison—Martin, G. E. (L.)
De Soto—Fortner, M. (C.)
Dighton—McGinnis, S. S. (L.)
Douglas—Fegtly, A. W. (L.)
Dunkirk—Pierce, R. P. (L.)
Ellsworth—Zerzan, G. F. (C.)
Elmo—Klingberg, W. A. (C.)
Emporia—Corbett, A. W. (L.)
Fontana—Fisher, C. A. (C.)
Greensburg—McLaughlin, J. A. (C.)
Hays—Anders, P. C. (L.)
Highland—Graham, J. W. (L.)
Humboldt—Payne, O. C. (L.)
Hutchinson—Forney, L. O. (L.)
Idana—Moore, D. J. (C.)
Leavenworth—McGee, C. J. (C.)
Lenexa—Jones, P. L. (L.)
Lincolnville—DeMand, J. W. (L.)
Madison—Haynes, E. E. (C.)
Paola—Lowe, O. C. (C.)
Parsons—Christmann, P. (C.)
Topeka—McNair, C. F. (C.)
Wellington—Coplan, L. S. (C.)
Downing, R. H. (L.)
Martin, W. M. (C.)
Whitewater—Nossman, A. H. (L.)
Wichita—Little, G. R. (L.)

KENTUCKY

Central City—Woodburn, C. (L.)
Cynthia—Wood, R. W. (C.)
Fredonia—Bailey, J. N. (L.)
Henderson—Yeaman, M. H. (M.)
Hopkinsville—Woodard, R. L. (C.)
Lexington—Busby, E. L. (C.)
Louisville—Allen, E. S. (C.)
Braun, S. A. (L.)
Galvin, J. W. (C.)
Kelly, C. W., Jr. (L.)
Liggett, H. T. (C.)
Scottville—Meredith, H. M. (C.)

LOUISIANA

Leesville—Williams, S. S. (L.)
New Orleans—Hogan, E. A. (L.)
McCarthy, E. (L.)
Seemann, W. H. (C.)

MAINE

Bangor—Woodcock, A. (C.)
Bath—Kershner, W. E. (M.)
Harrisburg—Frakes, E. N. (L.)

MARYLAND

Baltimore—Hardy, G. E. W., Jr. (C.)
Rivers, T. M. (L.)
Welch, W. H. (Col.)

MASSACHUSETTS

Boston—Baker, H. M. (L.)
Chase, H. M. (C.)
Dewees, J. H. (C.)
Lynch, J. M. (L.)
Cambridge—Fiegel, H. R. (L.)
Chicopee—Meyer, C. E. (L.)
Springfield—Gerrard, H. C. (L.)
Stoddard, M. J. (M.)
Waltham—Hamburg, M. M. (L.)

MICHIGAN

Adrian—Bland, J. P. (C.)
Ann Arbor—Cron, R. S. (L.)
Elliott, J. A. (L.)
Birch Run—McCrory, H. B. (L.)
Detroit—Hawkins, J. W. (L.)
Lynch, E. J. (L.)
Young, R. K. (C.)
Grosse Pointe—Griswold, D. M. (L.)
Pontiac—Butler, S. A. (C.)
Saginaw—DeFoe, W. A. (C.)
Sault Ste. Marie—Yale, I. V. (L.)

MINNESOTA

Delano—Phillips, A. E. (L.)
Jordan—Atkinson, N. E. (L.)
Le Roy—Warren, C. L. (C.)
Minneapolis—Van de Erve, H. (L.)
Rochester—Doggett, B. A. (L.)
Robinson, S. (M.)
Taylor, J. R. (L.)
St. Paul—Bock, R. A. (L.)
Dittman, G. C. (L.)
Finberg, J. (L.)
Larson, M. L. (L.)
Molander, H. A. (L.)
Woolson, C. (L.)
Wabash—Replogle, W. H. (C.)

MISSISSIPPI

Hattiesburg—Champenois, F. (L.)
New Augusta—Robinson, B. T. (C.)
Vicksburg—Howard, E. F. (C.)

MISSOURI

Appleton City—Rawlins, E. V. H. (C.)
Benton—Haw, U. P. (C.)
Brookfield—Brownfield, S. T. (C.)
Fore, T. P. (C.)
Standly, E. D. (C.)
Brownington—Strieby, U. G. (L.)
Cardwell—Birchett, J. G. (C.)
Carterville—O'Kelley, F. M. (C.)
Centertown—Francis, H. H. (L.)
Farmington—Smith, O. A. (C.)
Gray Bridge—Decker, A. J. (L.)
Hurdland—Wilsey, A. R. (L.)
Kansas City—Clark, E. H. (C.)
Clendining, L. (M.)
Crooks, O. R. (L.)
Czarlinsky, H. (L.)
Farr, F. F. (L.)
Lake, N. E. (L.)
Lane, H. H. (C.)
Sherman, C. A. (L.)
Vanorden, H. F. (L.)
Koenig—Hancks, J. A. (L.)
Koshkonong—Gullic, J. F. (L.)
Lathrop—Weir, L. R. (L.)
Maysville—Clark, W. J. (C.)
Moberly—Grote, O. A. (L.)
Shrader, E. W. (C.)
Moselle—Lowder, O. H. (L.)
Mountain Grove—Frame, H. G. (C.)
Pacific—McNay, A. L. (C.)
Paynesville—Guy, R. J. (L.)
Pierce City—Clark, H. R. (C.)
Reeds Spring—Shumate, L. S. (L.)
Rockport—Chamberlain, O. M. (L.)
Sedalia—Barnum, K. R. (L.)
St. Joseph—Cook, E. P. (C.)
Proud, W. C. (C.)
Spencer, F. H. (C.)
St. Louis—Abrams, S. F. (L.)
Doll, J. E. (L.)
Guhman, C. N. (C.)
Hall, K. H. (L.)
Hayman, A. T. (L.)
Heid, L. L. (L.)
Hyland, R. F. (L.)
Koenig, G. H. (L.)
Loew, E. C. (C.)
Lotz, J. A. (C.)
Martin, C. P. (L.)
Niedringhaus, R. E. (C.)
Pope, C. H. (C.)
Proetz, A. N. (C.)
Reider, C. R. (L.)
Salisbury, W. J. (L.)
Schuck, A. (C.)
Turner, R. G. (L.)
Upshaw, O. T. (L.)
Wezeau, S. (L.)
Vandusen—Traubitz, A. (L.)
Wellsville—Cox, S. S. (L.)
West Eminence—Henson, L. L. (L.)
Zahma—Back, G. C. (L.)

MONTANA

Big Sandy—Juckem, G. J. (C.)
Great Falls—Lord, B. E. (L.)
MacBurney, L. R. (L.)
Porter, T. M. (C.)
Kalispell—Creusel, C. N. G. (C.)
Red Lodge—Shore, W. B. (L.)

NEBRASKA

Aurora—Riley, W. H. (L.)
Creighton—Burrell, R. H. (C.)
David City—Rich, R. G. (C.)
Dodge—Patterson, F. B. (L.)
Havelock—Williams, G. E. (C.)
Lincoln—Emerson, C. (L.)
Omaha—Lurvey, H. D. (L.)
McGrew, W. R. (C.)
Simpson, J. E. (C.)
Polk—Leibee, J. R. (L.)
Red Cloud—Creighton, E. A. (C.)
Stockman, J. W. (L.)
Wisner—Morse, R. H. (L.)

NEVADA

Paradise Valley—Knorr, L. R. (M.)

NEW HAMPSHIRE

Milton—Buckley, J. J. (L.)

NEW JERSEY

Chatham—Pollard, J. E. (C.)
Dover—Costello, W. F. (L.)
Dunellin—Platt, T. H. (L.)
Jersey City—Nelson, A. (C.)
Willis, J., Jr. (L.)
Newark—Kelley, J. W. (C.)
New Brunswick—Gruessner, A. (C.)
Paterson—Cogan, H. (C.)
Maclay, J. A. (C.)
Princeton—Hickman, W. A. (C.)
Ridgewood—Keating, W. F. (C.)
Summit—Bowles, H. H. (L.)
West Orange—Bortone, F. (L.)

NEW MEXICO

Plain—Lancaster, W. M. (L.)

NEW YORK

Albany—Cox, J. A. (C.)
Brooklyn—Berkourtz, H. (L.)
Blair, H. T. (L.)
Blum, S. G. (L.)
Danzer, S. (L.)
Buffalo—Hammond, H. J. (L.)
Canastota—Germer, H. G. (C.)
Central Islip—Barnhardt, W. N. (C.)
Delevan—Fisher, M. E. (L.)
Jamaica—Lieberman, W. (L.)
Lafargeville—Tinkers, A. L. (C.)
New York—Adams, L. (C.)
Clifton, T. A. (L.)
Deming, C. K. (L.)
Edwart, D. G. (L.)
Fortuine, S. T. (L.)
Freeman, A. C. (L.)
Gover, R. W. (C.)
Haberman, J. V. (C.)
Halpern, T. (L.)
MacDonald, J., Jr., (M.)
Maloney, E. H. (L.C.)
New York—Manley, H. D. (L.)
Sonkin, M. (L.)
Telfair, J. H. (M.)
Trask, J. D. (L.)
Weingart, A. J. (L.)
Oneonta—Marsh, C. R. (C.)
Oriskany—Allen, B. P. (C.)
Owasso—Ford, N. B. (C.)
Rochester—McPherson, W. A. (L.)
Syracuse—Champlin, P. M. (L.)
Wappingers Falls—O'Brien, F. S. (L.)
West Point—Phelps, K. A. (C.)

NORTH CAROLINA

Elizabeth City—Jacocks, W. P. (C.)
Kenansville—Farrier, J. W. (C.)

NORTH DAKOTA

Carpio—Fisk, D. A. (C.)
Carrington—McClusky, O. W. (C.)
Kulm—Brenckle, J. F. (L.)
Williston—Dochterman, L. B. (C.)

OHIO

Amesville—Flinn, G. E. (L.)
Amsterdam—Gibson, F. S. (M.)
Archbold—Murbach, E. A. (C.)
Barberton—Livermore, F. B. (C.)
Stall, A. H. (C.)
Barnesville—McCartney, J. T. (C.)
Centerburg—McLaughlin, R. B. (C.)
Cincinnati—Freiberg, A. H. (M.)
Columbus—Wilcox, S. S. (C.)
Coshocton—McClain, J. (C.)
Dayton—Larkin, F. (L.)
Hamilton—Griffith, W. E. (C.)
Iberia—Virtus, D. B. (C.)
Lima—Berry, J. H. (L.)
McCutchenville—Heaton, J. J. (L.)
Niles—Williams, C. C. (C.)
Paulding—Fauster, J. U. (C.)
Pleasant City—Kackley, O. R. (L.)
The Plains—Nelson, L. D. (L.)
Toledo—Rees, O. C. (C.)
Wellston—Parker, W. H. (C.)

OKLAHOMA

Agra—Robinson, F. P. (L.)
Berlin—Clohessy, T. T. (L.)
Bradley—Barry, W. R. (C.)
Broken Arrow—Franklin, O. (L.)
Davis—Luster, J. C. (L.)
Dustin—Parker, C. E. (L.)
Garland—Davis, J. (L.)
Henryetta—Breese, H. E. (C.)
Holdenville—Howell, H. A. (L.)
Hollis—McFadin, J. C. (L.)
Lindsay—Matheny, J. C. (L.)
Manitou—Howell, C. A. (L.)
Marlow—Mavity, A. R. (L.)
Muldrow—Breedlove, J. C. (L.)
Oklahoma City—Alford, J. M. (C.)
Pilcher—Wharton, J. T. (L.)
Ponca City—Arrendell, C. W. (L.)
Skistock—Phillips, W. G. (L.)
Tecumseh—Fortson, J. L. (L.)

OREGON

Albany—Riggs, G. E. (L.)
Bend—Wilson, I. B. (L.)
Eugene—Barrow, G. E. (M.)
Juntura—Hedges, W. E. (L.)
La Grande—Hall, M. K. (C.)
Oatskansie—Wooden, J. L. (L.)
Pendleton—McKelway, J. I. (L.)
Portland—Blakeley, A. T. (L.)
Seaman, C. C. (L.)
Yamhill—Craver, R. B. (L.)

PENNSYLVANIA

Aspinville—Mitchell, L. T. (C.)
Avondale—Magraw, G. T. (C.)
Berwyn—Richards, F. L. (C.)
Boyers—Sisney, T. L. (L.)
Carlisle—Whistler, E. L. (L.)
Easton—Cope, W. F. (C.)
Ellentown—Brown, B. (C.)
Erie—Bedmarkiewicz, I. A. (C.)
Luke, R. H. (L.)
Indiana—Weitzel, W. F. (L.)
Leechburg—Parks, C. C. (L.)
McKees Rocks—Lafferty, J. A. (L.)
Oxford—Collins, A. A. (L.)
Philadelphia—Bridgett, F. A. (C.)
Day, E. O. (L.)
Du Bell, A. K. (L.)
Hinkle, W. M. (C.)
Smith, R. P. (C.)
Spaeth, L. A. (M.)
Stiles, C. M. (C.)
Swartley, W. B. (L.)
Pittsburgh—Keller, S. H. (L.)
McConnell, W. (C.)
Sanes, K. I. (C.)
Yarnall, A. H. (L.)
Reading—Newcomet, H. I. (L.)
Seylers, E. Y. (L.)
Wallingford—Furness, W. H. (C.)
Washington—Knox, J. C. (C.)
Wilkes-Barre—Ellsworth, E. M. (L.)

RHODE ISLAND

Pawtucket—Jenks, F. R. (C.)
Providence—Lincoln, W. C. (C.)
Whitmarsh, R. H. (C.)

SOUTH CAROLINA

Abbeville—Hill, J. C. (L.)
York—Barron, J. I. (C.)

SOUTH DAKOTA

Armour—Wilson, R. D. (C.)
Frankfort—Guaffroy, H. A. (L.)
Gregory—Murnan, H. A. (C.)
Lead—Markel, I. J. (L.)
Sioux Falls—Stevens, R. G. (L.)
Watertown—Parsons, H. C. (M.)
Waubay—Hawkins, A. P. (L.)

TENNESSEE

Beech Grove—Wysong, H. C. (L.)
Franklin—Rose, J. H. (M.)
Knoxville—Rogers, O. W. (L.)
Madison—Swift, C. L. (L.)
McKenzie—Alexander, H. L. (C.)
Memphis—Lewis, E. (L.)

TEXAS

Ballinger—Hale, F. M. (C.)
Beaumont—Garth, J. W. (C.)
Harlan, H. D. (L.)
Benford—Payne, M. (L.)
Byers—Shepherd, F. D. (C.)
Canadian—Teas, F. D. (C.)
Dallas—Compere, D. E. (L.)
Dawson—Steen, C. T. (L.)
Dayton—Spear, R. (L.)
Denton—Rowe, H. (L.)
Doucette—Bevil, H. G. (L.)
Fort Worth—Wilson, S. J. (C.)
Godley—Yater, T. F. (L.)
Grapeland—Hill, C. (L.)
Kennedy, S. (L.)
Houston—White, A. E. (C.)
Overton—Barton, W. P. (C.)
Port Arthur—Bledsoe, M. F. (C.)
Post—Castleberry, G. G. (L.)
San Marcos—Vanness, J. M. (L.)
Sherman—Neer, E. D. (L.)
Sulphur Springs—Long, W. F. (L.)
Walburg—Whigham, J. G. (L.)

UTAH

Huntington—Hill, T. C. (L.)
Provo—Hasler, W. T. (L.)
Salt Lake City—Ulman, S. J. (L.)
Wheeler, T. H. (C.)

VERMONT

East Arlington—Gray, S. K. (L.)
Hardwick—George, B. D. (L.)

VIRGINIA

Coeburn—Culbertson, W. R. (L.)
Lovettsville—Foley, C. E. (L.)
University—Bardin, J. C. (L.)

WASHINGTON

Montesano—Brachvogel, M. W. (C.)
Spokane—Collins, I. S. (C.)
Tacoma—Hunter, C. D. (L.)

WEST VIRGINIA

Parkersburg—Harris, T. L. (L.)

WISCONSIN

Beloit—Burger, H. E. (L.)
Cambridge—Bilstad, G. E. (L.)
Fennimore—Bailey, M. A. (C.)
Fond du Lac—McCabe, P. G. (L.)
Minahan, P. R. (C.)
Fox Lake—Rosenheimer, A. M. (L.)
Granton—Rath, R. R. (L.)
Horicon—Simon, L. J. (L.)
Madison—Smith, K. W. (C.)
Manitowoc—MacCollum, C. L. (L.)
Milwaukee—Eisenberg, J. J. (L.)
Fox, P. A. (C.)
Nahm, H. L. (L.)
Ross, P. M. (L.)
Westhofen, R. C. (L.)
Tigerton—Gates, A. J. (C.)
Wausau—Ladwig, W. A. (C.)

WYOMING

Crosby—Hamilton, T. F. (L.)
Dietz—Schunk, E. R. (L.)
Evanston—Thompson, A. P. (L.)
Lovell—Torjuson, T. B. (L.)
Sheridan—Denison, E. G. (C.)

ORDERS TO OFFICERS OF THE MEDICAL CORPS, U. S. ARMY

Alabama

To Fort Oglethorpe, from Camp Sheridan, Capt. E. M. PRINCE, Birmingham.

To Rochester, Minn., Mayo Clinic, for instruction, and on completion *to his proper station,* from Richmond, Capt. A. W. RALLS, Gadsden.

The following order has been revoked: *To Fort McPherson, Ga.,* from Fort Oglethorpe, Lieut. E. O'CONNELL, Birmingham.

Arkansas

To Camp MacArthur, Texas, as camp sanitary inspector, from Camp Pike, Major W. H. ABINGTON, Beebe.

To report to the commanding general, Central Department, from Fort Riley, J. F. HALBROOK, Center Ridge.

California

To Army Medical School for instruction, from Fort Oglethorpe, Capt. J. M. WASTO, San Francisco.

To Camp Kearney, Calif., as assistant to camp surgeon, from San Francisco, Major A. C. MILLER.

To Denver, Colo., from Camp MacArthur, Capt. C. E. IDE, Redlands.

To Eastview, N. Y., from Camp Pike, Lieut. L. O. W. MOORE, Alameda; from Rockefeller Institute, Lieut. M. C. CHENEY, Berkeley.

To Rockefeller Institute for instruction in the treatment of infected wounds, and on completion *to Williamsbridge, N. Y.,* from Camp Pike, Capt. F. C. PACHE, Ventura.

To Walter Reed General Hospital, D. C., from New Haven, Major W. E. CHAMBERS, Oakland.

To Washington, D. C., St. Elizabeth's Hospital, from Ann Arbor, Lieut. A. SMITH, San Jose.

To Whipple Barracks, Ariz., from Fort Riley, Capt. J. H. MEYER, San Bernardino.

Canal Zone

To Fort McPherson, Ga., from Fort Oglethorpe, Lieut. M. JOSEPH, Ancon.

Colorado

To Denver, Colo., from Mineola, Capt. M. D. BROWN, Craig.

To Rockefeller Institute for instruction in the treatment of infected wounds, and on completion *to Williamsbridge, N. Y.,* from Camp Pike, Lieut. R. R. TAYLOR, Pueblo.

Connecticut

To Azalea, N. C., from Camp Wadsworth, Capt. E. H. METCALF, Rockville.

To Dallas, Texas, Love Field, from Waco, Lieut. J. D. RUSSO, New Haven.

To Eastview, N. Y., from Rockefeller Institute, Lieut. W. A. MONAGHAN, Hartford.

To Fort McPherson, Ga., from Fort Oglethorpe, Capt. B. F. DONOHUE, Forestville.

To Hoboken, N. J., from Camp A. A. Humphreys, Capt. R. M. YERGASON, Hartford; from Camp Dix, Lieut. H. M. HURWITZ, Hartford.

The following order has been revoked: *To Army Medical School,* from Fort Oglethorpe, Capt. T. F. BEVANS, Waterbury.

District of Columbia

To Camp Greene, N. C., base hospital, from New Haven, Lieut. A. L. GUERRA, Washington.

To Camp Lewis, Wash., from the Surgeon-General's Office, Major C. R. CASTLEN.

To Fort McPherson, Ga., from Fort Oglethorpe, Capt. H. C. COOK, Washington.

To Hot Springs, N. C., from Fort Oglethorpe, Lieut. F. T. CHAMBERLIN, Washington.

To Rochester, Minn., Mayo Clinic, for instruction, and on completion *to Fort Riley,* base hospital, from Fort Oglethorpe, Major J. B. PIGGOTT, Washington.

Florida

To Camp Meade, Md., from Fort Oglethorpe, Lieut. R. G. NELSON, Tampa.

To Camp Meigs, D. C., from Fort Oglethorpe, Lieut. W. L. NUTTER, Lake Worth.

To Houston, Texas, Ellington Field, from Waco, Lieut. M. A. LISCHKOFF, Pensacola.

Georgia

To Biltmore, N. C., from Fort Oglethorpe, Capt. J. T. FLOYD, Atlanta.

To Camp Abraham Eustis, Va., as camp surgeon, from Fort Oglethorpe, Lieut.-Col. T. J. FLYNN.

To Camp Zachary Taylor, Ky., as camp surgeon, from Fort Oglethorpe, Col. J. C. GREGORY.

To Fort McPherson, Ga., from Fort Oglethorpe, Lieut. C. H. DICKENS, Grayson.

To Newport News, Va., from Fort Oglethorpe, Lieut.-Col. H. H. BAILY.

To Plattsburg Barracks, N. Y., from Harrisburg, Lieut. M. D. CLAYTON, Milledgeville.

To Washington, D. C., Surgeon-General's Office, from Fort Oglethorpe, Col. R. BROOKE.

Idaho

To Camp Lewis, Wash., base hospital, from Colonia, Lieut. G. H. KENNETT, Kellogg.

Illinois

To Azalea, N. C., from Camp Wadsworth, Lieut. F. H. GBRCZYK, Joliet.

To Camp Dix, N. J., from Camp Jackson, Lieut. W. S. MIX, Beardstown.

To Camp Grant, Ill., from Camp Pike, Lieut. H. B. CULVER, Chicago. Base hospital, from Fort Oglethorpe, Lieut. E. E. BULLARD, Girard; from New Haven, Capt. C. WAKEFORD, Morris City.

To Camp Jackson, S. C., base hospital, from New Haven, Lieut. L. J. TINT, Chicago.

To Camp Sheridan, Ala., base hospital, from Camp Custer, Capt. D. N. EISENDRATH, Chicago.

To Camp Zachary Taylor, Ky., base hospital, from Fort Oglethorpe, Lieuts. B. L. VILNA, Cicero; H. W. ACKEMANN, Rockford.

To Chicago, Ill., from Camp Gordon, Lieut. C. M. DEBECK, Chicago; from New York, Major F. S. O'HARA, Springfield.

To Eastview, N. Y., from Camp Sevier, Lieut. E. ANDREWS, Chicago.

To Everman, Texas, Barron Field, from San Antonio, Capt. C. P. CHAFFIN, Chicago.

To Fort Des Moines, Iowa, from Fort Oglethorpe, Lieut. J. R. LAVIERI, Chicago.

To Fort Sheridan, Ill., from Camp Wadsworth, Capt. J. W. VANDERSLICE, Oak Park; from Fort Oglethorpe, Lieut. A. L. REAMS, Chicago; J. H. WEDIG, Granite City.

To New Cumberland, Pa., from Fort Riley, Lieut. M. L. HARTMAN, Garden Prairie.

To Riverside, Calif., March Field, from Lake Charles, Capt. G. C. OTRICH, Belleville.

To Rochester, Minn., Mayo Clinic, for instruction, and on completion to his proper station, from Fort Sheridan, Capt. J. B. MOORE, Ziegler; Lieut. B. F. DAVIS, Chicago.

To Toledo, Ohio, from Fort Hancock, Lieut. L. B. CLINTON, Chicago.

To Walter Reed General Hospital, D. C., for instruction, from Fort Oglethorpe, Capt. M. L. GALLAGHER, Lieut. D. H. HOWELL, Chicago.

The following orders have been revoked: *To Army Medical School,* from Fort Oglethorpe, Lieut. W. A. GROSS, Chicago. *To Fort McHenry, Md.,* from Fort Oglethorpe, Lieut. V. M. LA MARRE, Chicago.

Indiana

To Detroit, from Fort Oglethorpe, Capt. W. H. BAKER, South Bend; from Rockefeller Institute, Capt. J. P. Seale, Fairmount.

To Fort Benjamin Harrison, Ind., from Fort Oglethorpe, Capt. B. M. HUTCHINGS, Terre Haute.

To Fort McHenry, Md., from Camp McClellan, Capt. H. A. VAN OSDOL, Indianapolis; from Fort Oglethorpe, Capt. A. A. THOMAS, Linton; from Rockefeller Institute, Lieut. E. L. SCHAIBLE, Gary.

To Fort Sam Houston, Texas, base hospital, from Colonia, Lieut. L. C. SAMMONS, Shelbyville.

To Fort Sheridan, Ill., from Fort Oglethorpe, Capt. J. H. COOK, Terre Haute.

To Fort Sill, Okla., Post Field, from Lonoke, Ark., Capt. D. D. JOHNSTON, Fort Wayne.

To New Cumberland, Pa., from Fort Riley, Lieut. S. M. COMPTON, Forest.

To Pittsburgh, Pa., from Fort Oglethorpe, Lieuts. C. BAKER, Evansville; L. R. ELARS, Peru.

To Walter Reed General Hospital, D. C., for instruction, from Fort Oglethorpe, Lieut. G. C. PROCTOR, Muncie.

The following order has been revoked: *To Camp Custer, Mich.,* from Fort Oglethorpe, Capt. C. C. FUNK, New Albany.

Iowa

To Eastview, N. Y., from Camp Sevier, Lieut. C. E. DAKIN, Mason City.

To Fort Des Moines, Iowa, from Rockefeller Institute, Lieut. W. H. HOMBACH, Remsen.

To Fort McHenry, Md., for instruction, from Fort Oglethorpe, Capt. M. B. DUNNING, Conway.

To Fort Sheridan, Ill., from Fort Oglethorpe, Lieut. C. D. MERCER, West Union.

To Pittsburgh, Pa., from Fort Oglethorpe, Lieut. C. BAKER, Colo.

To Rochester, Minn., Mayo Clinic, for instruction, and on completion to his proper station, from Fort Des Moines, Capt. F. R. HOLBROOK, Des Moines.

To Rockefeller Institute for instruction in the treatment of infected wounds, and on completion *to Fort McHenry, Md.,* from Camp Dodge, Capt. J. E. SWANSON, Sioux City.

Kansas

To Camp Custer, Mich., base hospital, from New Haven, Capt. H. N. MOSES, Salina.

To Fort Des Moines, Iowa, from Fort Oglethorpe, Capt. L. F. BARNEY, Kansas City.

To Fort Riley, base hospital, from Rockefeller Institute, Lieut. R. W. VAN DEVENTER, Wellington.

The following order has been revoked: *To Camp Kearney, Calif.,* base hospital, from Fort Oglethorpe, Lieut. D. L. MORGAN, Emporia.

Kentucky

To Camp Gordon, Ga., base hospital, from Walter Reed General Hospital, Lieut. G. L. THOMPSON, Lovelaceville.

To Camp Zachary Taylor, Ky., as assistant to camp surgeon, from Camp Henry Knox, Major F. H. MILLS.

To New Cumberland, Pa., from Fort Riley, Lieut. O. F. HUME, Mackville.

To West Point, N. Y., from West Point, Ky., Major A. G. WILDE.

The following order has been revoked: *To Colonia, N. J.,* from Fort Oglethorpe, Capt. W. A. BUSH, Winchester.

Maine

To Fort Sill, Okla., Post Field, from Lonoke, Ark., Capt. S. E. FISHER, Portland.

Maryland

To Camp Meade, Md., Major E. B. FRIEDENWALD, Baltimore. Base hospital, from Camp Lee, Major N. M. OWENSBY, Baltimore.

To Washington, D. C., Surgeon-General's Office, Lieut.-Col. W. S. BAER, Baltimore.

Massachusetts

To Army Medical School for instruction, from Fort Oglethorpe, Lieut. N. J. KING, Boston.

To Camp Grant, Ill., to examine the command for cardiovascular diseases, from Camp Devens, Capt. H. K. BOUTWELL, Brookline.

To Camp Upton, N. Y., as orthopedic surgeon, from Fort Oglethorpe, Lieut. D. A. GARBELNICK, Haverhill.

To Cape May, N. J., from Walter Reed General Hospital, Lieut. J. B. A. JOHNSON, Lowell.

To Colonia, N. J., from Camp Dix, Lieut. E. Y. KAU, Boston.

To Dallas, Texas, Love Field and St. Paul's Sanatorium, from Mineola, Lieut. T. F. CAPELES, Haverhill.

To Eastview, N. Y., from Camp Sevier, Capt. G. A. MOORE, Brockton.

To Fort McHenry, Md., from Fort Oglethorpe, Capt. J. D. CLARK, Boston.

To Fort Snelling, Minn., from Walter Reed General Hospital, Capt. F. A. BARDWELL, Boston.

To Plattsburg Barracks, N. Y., from Carlisle, Capt. R. A. GREENE, Palmer.

To Rochester, Minn., Mayo Clinic, for instruction, and on completion to his proper station, from Fort McHenry, Lieut. A. R. GARDNER, Lowell.

To Walter Reed General Hospital, D. C., for instruction, from Fort Oglethorpe, Lieut. J. D. CHRISTIE, Littleton.

To Washington, D. C., Surgeon-General's Office, from Newport News, Major Z. B. ADAMS, Brookline.

Michigan

To Chicago, from Fort Oglethorpe, Lieut. T. H. E. BEST, Detroit.

To Fort Sheridan, Ill., from New York City, Lieut. H. W. WILEY, South Haven.

To Rochester, Minn., Mayo Clinic, for instruction, and on completion *to his proper station*, from Detroit, Lieut. J. W. WARREN, Detroit; from Fort Des Moines, Lieut. D. H. McRAE, Mount Pleasant; from Fort Sheridan, Capt. C. GEORG, Jr., Ann Arbor.

To Rockefeller Institute for instruction in the treatment of infected wounds, and on completion *to Williamsbridge, N. Y.*, from Camp Pike, Capt. J. A. KIMZEY, Detroit.

To Walter Reed General Hospital, D. C., for instruction, from Columbus Barracks, Lieut. E. J. AGNELLY, Detroit; from Fort Oglethorpe, Lieuts. F. W. BURNHAM, S. H. CRAIG, Detroit.

To West Baden, Ind., from Jeffersonville, Capt. C. B. GARDNER, Alma.

The following order has been revoked: *To Camp Kearney, Calif.*, base hospital, from Camp MacArthur, Capt. J. O. PARKER, Owosso.

Minnesota

To Fort Des Moines, Iowa, from Fort Oglethorpe, Lieut. L. R. LIMA, Montevido.

To Fort Sill, Okla., Post Field, from Lake Charles, Lieut. P. B. GILLESPIE, Minneapolis.

To Fort Snelling, Minn., from Fort Oglethorpe, Capt. W. W. HIGGS, Park Rapids; Lieut. K. A. DANIELSON, Litchfield; from Rockefeller Institute, Lieut. L. BAKER, Minneapolis.

To Riverside, Calif., March Field, from Berkeley, Lieut. R. A. JOHNSON, Minneapolis.

To Walter Reed General Hospital, D. C., from Fort Oglethorpe, Lieut. C. R. SANBORN, Bemidji.

To the retired list, from the Surgeon-General's Office, Major J. D. YOST, Duluth.

Mississippi

To Walter Reed General Hospital, D. C., for instruction, from Fort Oglethorpe, Capt. J. T. HOSEY, Enterprise.

To West Baden, Ind., from Fort Oglethorpe, Capt. G. A. SEYBOLD, Jackson.

Missouri

To Camp Beauregard, La., from Camp Hancock, Capt. D. E. SCHMALHORST, St. Louis.

To Camp Forrest, Ga., as orthopedic surgeon, from Fort Oglethorpe, Capt. W. C. VERNON, Kansas City.

To Everman, Texas, Barron Field, from Dallas, Lieut. J. M. POTTS, Springfield.

To Fort Sheridan, Ill., from Fort Oglethorpe, Capt. H. B. DAVIS, Kansas City.

To Rockefeller Institute for instruction in the treatment of infected wounds, and on completion *to Camp Upton, N. Y.*, base hospital, from Camp Pike, Lieut. M. PITZMAN, St. Louis.

To Williamsbridge, N. Y., from Camp Bowie, Capt. W. B. YOUNG, St. Louis.

The following order has been revoked: *To Camp Morrison, Va.*, from Camp Zachary Taylor, Lieut. J. C. PEDEN, St. Louis.

Montana

To Fort Bayard, N. M., from Fort Riley, Lieut. F. A. WOODWARD, Great Falls.

To Rockefeller Institute for instruction in the treatment of infected wounds, and on completion *to Long Beach, N. Y.*, from Camp Grant, Lieut. G. F. TURMAN, Missoula.

Nebraska

To Camp Dix, N. J., from Camp Zachary Taylor, Capt. W. E. M. DEVERS, Cowles.

To Camp Polk, N. C., from Camp Wadsworth, Capt. E. M. BARNES, Omaha.

To Denver, Colo., from Camp MacArthur, Capt. L. S. B. ROBINSON, Lincoln.

To Fort Des Moines and *Camp Dodge, Iowa*, base hospitals, from Newport News, Lieut. W. E. WOLCOTT, Omaha.

To Riverside, Calif., March Field, from Berkeley, Lieut. J. R. KLEYLA, Omaha.

New Hampshire

To Walter Reed General Hospital, D. C., for instruction, from Fort Oglethorpe, Capt. B. W. CARR, Pittsfield.

New Jersey

To Azalea, N. C., from New York, Major J. J. BRODERICK, Jersey City.

To Camp Dix, N. J., base hospital, from New Haven, Lieut. H. E. BURBANK, Belleville.

To Camp Meade, Md., from Fort Oglethorpe, Lieut. W. A. RULLMAN, Red Bank.

To Camp Upton, N. Y., as orthopedic surgeon, from Fort Oglethorpe, Lieuts. M. S. FRANK, Bayonne; G. J. V. VAN SCHOTT, Passaic.

To Detroit, Mich., from Richmond, Lieut. I. S. INGBER, Secaucus.

To Fort Bayard, N. M., from Fort Monroe, Lieut. H. F. WESTCOTT, Bridgeton.

To Fort McPherson, Ga., from Fort Oglethorpe, Lieut. C. P. DE FUCCIO, Jersey City.

To Hoboken, N. J., from Camp Wheeler, Capt. F. A. FINN, Jersey City; from New Haven, Lieut. H. A. SCHEPPACH, Newark.

To Rochester, Minn., Mayo Clinic, for instruction, and on completion *to his proper station*, from Lakewood, Lieut. H. R. VAN NESS, Newark.

New Mexico

To Azalea, N. C., from Camp Wadsworth, Lieut. S. M. EDMONSON, Clayton.

New York

To Army Medical School, from Fort Oglethorpe, Capt. T. L. HEIN, New York; Lieut. C. L. WAKEMAN, Andes. For instruction, from Fort Oglethorpe, Capt. C. C. RANSON, Schenectady; Lieut. E. B. FARLEY, New York.

To Camp McClellan, Ala., base hospital, from Camp Custer, Capt. S. ERDMAN, New York.

To Camp Meade, Md., base hospital, from Fort Oglethorpe, Capt. H. R. WILLSE, Westfield; Lieut. R. G. HAYS, Brooklyn; from Walter Reed General Hospital, Capt. C. WOLF, New York.

To Camp Meigs, D. C., from Washington, Lieut. C. W. CULVER, Lowville.

To Camp Pike, Ark., base hospital, from Camp MacArthur, Lieut. G. FREIMAN, Brooklyn.

To Camp Polk, N. C., from Camp Zachary Taylor, Lieut. H. ACKERMAN, New York.

To Camp Sherman, Ohio, base hospital, from Fort Sill, Capt. L. H. NAHUM, New York.

To Camp Upton, N. Y., as tuberculosis examiner, from Camp Jackson, Lieut. M. GREENWALD, New York; from Garden City, Lieut. G. G. HATZEL, New York. Base hospital, from New Haven, Lieut. M. M. NEMSER, New York.

To Eastview, N. Y., from Fort McPherson, Lieut.-Col. C. N. B. CAMAC, New York; from Fort Oglethorpe, Capt. E. BRUNOR, New York; from Rockefeller Institute, Lieuts. W. E. ZIELINSKI, Buffalo; A. HOFHEIMER, New York.

To Fort Des Moines, Iowa, from Camp Dix, Lieut. J. L. LINN, Brooklyn; from Cape May, Capt. J. KETTERLE, Brooklyn.

To Fort McPherson, Ga., from Fort Oglethorpe, Capt. J. J. CLARK, Olean; Lieut. F. A. BIEN, New York.

To Fort Porter, N. Y., from Rockefeller Institute, Lieut. L. J. STRONG, Buffalo.

To Governors Island, N. Y., from New York, Capt. J. R. HARDING, Elmira.

To Hoboken, N. J., from Camp Lee, Capt. G. A. POWERS, Brooklyn; from New Haven, Lieuts. C. H. HOCHMAN, New York; W. I. WALSH, Troy.

To Middletown, Pa., from Fort Oglethorpe, Lieut. H. H. SHIRAS, New York.

To Mineola, N. Y., Hazelhurst Field, from New York, Major L. T. LEWALD, New York.

To Newport News, Va., from Madison Barracks, Capt. A. E. SOPER, Wards Island.

To Otisville, N. Y., from Camp Jackson, Capt. S. L. CASH, New York.

To Rochester, Minn., Mayo Clinic, for instruction, from Rockefeller Institute, Major L. J. REGAN.

To Walter Reed General Hospital, from Boston, Lieut. F. W. SEWARD, Jr., Goshen; from Camp Meade, Capt. W. J. HIGHMAN, New York. For instruction, from Fort Oglethorpe, Capt. J. R. HUNTER, New York.

To Washington, D. C., St. Elizabeth's Hospital, from New York, Capt. K. A. ENLIND, New York. Surgeon-General's Office, from Camp Abraham Eustis, Major A. H. PARSONS, Great Neck; from Camp Sevier, Capt. J. B. ZABRISKIE, Brooklyn.

To Williamsbridge, N. Y., from Fort Oglethorpe, Major G. WALTER, New York.

The following orders have been revoked: *To Camp Meade, Md.*, from Fort Oglethorpe, Capt. C. F. POTTER, Syracuse. *To Fort Snelling, Minn.*, from Fort Oglethorpe, Lieut. R. C. MOONEY, Gloversville. *To Pittsburgh, Pa.*, from Fort Oglethorpe, Capt. S. T. HUBBARD, New York.

North Dakota

To Fort Des Moines, Iowa, from Camp Beauregard, Lieut. J. F. HANNA, Fargo.

Ohio

To Camp Dix, N. J., as orthopedic surgeon, from Fort McHenry, Capt. A. M. STEINFELD, Columbus.

To Camp Dodge, Iowa, base hospital, from Camp Sherman, Lieut. C. G. McPHERSON, Xenia.

To Denver, Colo., from Fort Oglethorpe, Lieut. C. L. RUGGLES, Cleveland.

To Eastview, N. Y., from Fort Oglethorpe, Capt. F. M. BURNS, Cincinnati.

To Newport News, Va., from Fort Oglethorpe, Lieut. D. P. PHILIPS, Jr., Columbus.

To Rockefeller Institute for instruction in the treatment of infected wounds, and on completion *to Colonia, N. J.*, from Camp Zachary Taylor, Lieut. O. BEHRMAN, Cincinnati. On completion *to Eastview, N. Y.*, from Camp Sherman, Capt. J. G. BLOWER, Akron.

The following order has been revoked: *To Lakewood, N. J.*, from Fort Oglethorpe, Capt. A. B. LIPPERT, Cincinati.

Oklahoma

To Colonia, N. J., for instruction, from Fort Oglethorpe, Lieut. J. J. BARBER, Laverne.

To Fort Bayard, N. M., from Fort Oglethorpe, Capt. J. E. HUGHES, Shawnee.

To Fort Des Moines, Iowa, from Fort Riley, Lieut. B. W. RUSSELL, Strong City.

Pennsylvania

To Army Medical School, from Fort Oglethorpe, Lieut. H. P. MEYERS, Confluence. For instruction, from Fort Oglethorpe, Lieut. C. P. LEININGER, Pittsburgh.

To Camp Dodge, Iowa, base hospital, from Camp Sherman, Capt. T. A. STEELE, McKeesport.

To Camp Kearney, Calif., as camp surgeon, from Camp Crane, Lieut.-Col. H. M. SNYDER.

To Camp Meade, Md., base hospital, from Fort Oglethorpe, Capts. C. C. RINARD, Homestead; H. M. STEWART, Johnstown.

To Camp Meigs, D. C., from Washington, Lieut. S. B. THOMAS, Waynesboro.

To Camp Pike, Ark., base hospital, from Fort Oglethorpe, Lieut. A. I. SLAGLE, Vandergrift.

To Camp Polk, N. C., from Fort Totten, Major A. W. YALE, Philadelphia.

To Camp Sherman, Ohio, to examine the troops for cardiovascular diseases, from Camp Grant, Lieut. T. G. JENNY, Pittsburgh.

To Camp Upton, N. Y., as tuberculosis examiner, from Garden City, Lieut. W. C. JOHNSON, Philadelphia.

To Eastview, N. Y., from Fort Oglethorpe, Lieut. J. C. DEAL, Philadelphia.

To Fort Des Moines, Iowa, from Rockefeller Institute, Lieut. L. W. WRIGHT, Williamsport.

To Fort McPherson, Ga., from Fort McHenry, Major E. H. GOODMAN, Philadelphia; from Fort Oglethorpe, Lieuts. W. S. BELL, Greensburg; W. P. DODDS, Pittsburgh.

To Fort Leavenworth, Kan., from Camp Pike, Lieut. W. H. BUTZ, Allentown.

To Hoboken, N. J., from Camp Gordon, Lieut. G. W. MELLON, Woodlawn; from Fort Niagara, Major S. M. HUFF, Bellefonte.

To Madison Barracks, N. Y., from Rockefeller Institute, Lieut. J. A. COEN, Bristoria.

To Pittsburgh, Pa., from Camp Gordon, Lieut. R. A. WOLFF, New Kensington.

To Riverside, Calif., March Field, from Berkeley, Lieut. R. T. M. DONNELLY, Philadelphia.

To Rochester, Minn., Mayo Clinic, for instruction, and on completion *to his proper station*, from Fort Benjamin Harrison, Capt. C. A. HILL, Pittsburgh; from Fort Des Moines, Capt. C. B. LUFBURROW, Philadelphia.

To Walter Reed General Hospital, D. C., from Fort Oglethorpe, Capt. W. C. SHAW, Ridgeway.

The following order has been revoked: *To Fort McHenry, Md.*, from Fort Oglethorpe, Capt. C. B. WORDEN, Philadelphia.

South Carolina

To Biltmore, N. C., from Fort Oglethorpe, Capt. W. S. ZIMMERMAN, Spartanburg.

South Dakota

To Rockefeller Institute for instruction in the treatment of infected wounds, and on completion *to Fort McHenry, Md.*, from Camp Dodge, Capt. W. O. LEACH, Huron.

Tennessee

To Camp Sheridan, Ala., base hospital, from Rockefeller Institute, Lieut. C. L. DAVIDSON, Lexington.

To Colonia, N. J., for instruction, from Fort Oglethorpe, Lieut. C. W. ROBINSON, Memphis.

To Dallas, Texas, Love Field, from Camp Dick, Major V. K. EARTHMAN, Murfreesboro.

To Fort McHenry, Md., for instruction, from Fort Oglethorpe, Lieut. C. F. THOMASON, Nashville.

To Fort McPherson, Ga., from Camp Meade, Lieut. E. H. DELAY, Chattanooga; from Fort Oglethorpe, Lieut. J. F. GALLAGHER, Nashville.

To Rochester, Minn., Mayo Clinic, for instruction, and on completion *to his proper station*, from Detroit, Capt. E. D. MITCHELL, Memphis.

The following orders have been revoked: *To Camp Joseph E. Johnston, Fla.*, base hospital, from Fort Oglethorpe, Lieut. H. Q. FLETCHER, Chattanooga. *To Camp Sevier, S. C.*, base hospital, from Fort Oglethorpe, Lieut. W. STEELE, Chattanooga.

Texas

To Camp Kearney, Calif., as division surgeon, from Camp Travis, Lieut.-Col. H. P. CARTER.

To Camp Travis, Texas, base hospital, from Rockefeller Institute, Capt. H. B. KINGSBURY, Fort Worth.

To Detroit, Mich., from New Haven, Lieut. O. T. KIRKEY, Galveston.

To Fort McPherson, Ga., from Fort Oglethorpe, Lieut. J. W. MACUNE, Davilla.

To Fort Sam Houston, Texas, base hospital, from Fort Riley, Lieut. R. T. TRAVIS, Dallas.

The following orders have been revoked: *To Camp Crane, Pa.*, from Hoboken, Lieut. H. T. SMITH, Dallas. *To Camp Jackson, S. C.*, from Atlanta, Capt. E. C. FOSTER, Whitt.

Utah

To Camp Lewis, Wash., base hospital, from Rockefeller Institute, Lieut. P. S. HAGEMAN, Bingham Canon.

To New Cumberland, Pa., from Fort Riley, Lieut. J. C. HARDIE, Garfield.

Vermont

To Boston, Mass., for instruction, from Fort Oglethorpe, Lieut. H. L. PIERCE, Swanton.

To Camp Upton, N. Y., from Washington, Major H. N. JACKSON, Burlington.

To East View, N. Y., from Rockefeller Institute, Capt. G. H. PARMENTER, Montpelier.

Virginia

To Camp Lee, Va., base hospital, from Rockefeller Institute, Lieut. C. H. IDEN, Berryville.

To Richmond, Va., from Camp Dix, Lieut. R. C. HOCKER, Richmond.

To Rochester, Minn., Mayo Clinic, for instruction, and on completion *to his proper station*, from Biltmore, N. C., Capt. J. T. BUXTON, Newport News.

To West Point, N. Y., from Fort Oglethorpe, Lieut. W. H. RE MINE, Lodi.

Washington

To Camp Lewis, Wash., base hospital, from Camp Dodge, L. B. BALDWIN, Seattle.

To Vancouver Barracks, Wash., from Southern Department, Capt. J. B. BLAIR, Vancouver.

The following order has been revoked: *To Fort Monroe, Va.*, from Camp Crane, C. R. McCREARY, Tacoma.

West Virginia

To Camp Meade, Md., base hospital, from Detroit, Major H. D. HATFIELD, Huntington.

Wisconsin

To Camp Jackson, S. C., Emerson Field, from Americus, Ga., Capt. J. J. FRANCE, Milwaukee.

To Colonia, N. J., from Walter Reed General Hospital, Capt. J. C. ELSON, Madison.

To Rockefeller Institute for instruction in the treatment of infected wounds, and on completion *to Camp Upton, N. Y.*, base hospital, from Camp Pike, Lieut. A. YAFFE, Milwaukee.

ORDERS TO OFFICERS OF THE UNITED STATES PUBLIC HEALTH SERVICE

Sen. Surg. G. M. MAGRUDER, rejoin station at Tacoma, Wash., and proceed to Portland, Ore., to effect transfer of property at those stations.

Surg. B. J. LLOYD, granted three months' leave of absence from Jan. 2, 1919, with permission to proceed beyond the seas.

Passed Asst. Surg. J. A. WATKINS, granted two months' leave of absence on account of sickness with permission to proceed beyond the seas.

Passed Asst. Surg. H. C. CODY, proceed to Washington, D. C., for duty in epidemiologic investigations of influenza. Relieved at New London, Conn.

Asst. Surg. J. W. MOUNTIN, relieved at Waco, Texas; proceed to Marine Hospital, Chelsea, Mass.

Acting Asst. Surg. H. E. HENRY, relieved at Fort Worth, Texas; proceed to San Antonio, Texas, for duty.

Acting Asst. Surg. W. E. REASNER, proceed to necessary places in the State of Mississippi for duty in connection with the control of influenza.

Scien. Asst. L. L. LEE, relieved from duty in the District of Columbia, proceed to Chester, Pa., for duty.

Scien. Asst. E. N. RILEY, proceed to Philadelphia, Pa., for duty in field investigations of industrial sanitation.

Resignation of Passed Asst. Surg. H. M. THOMETZ accepted by direction of the President, effective March 16, 1919.

Resignation of Asst. Surg. JOHN S. RUOFF accepted by direction of the President, effective March 19, 1919.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ILLINOIS

Library Given to Hospital.—Dr. Edmund W. Weis, Ottawa, who was recently appointed head of the hygienic institute, LaSalle, has donated his entire medical library to the Ryburn Memorial Hospital, Ottawa.

Officers Returned from France.—Lieut.-Col. Frederick A. Besley, M. C., U. S. Army, has returned to Chicago, and will go for a short vacation to California.——Lieut.-Col. Milton Mandel, M. C., U. S. Army, who went abroad as chief of the medical staff of Base Hospital No. 12, has returned to Chicago.

Proposed Change in Health Law.—The state department of public health is seeking the passage of an act providing for the appointment of a full-time health officer in each of the 102 counties of the state. An effort will also be made to modernize the relation of the state to the state's wards, and to provide physical rehabilitation of the state institutions on the business basis.

New Officers.—At the annual meeting of the Madison County Medical Society and the Madison County Anti-Tuberculosis Association, held in Edwardsville, January 4, Dr. Charles R. Kiser, Madison, was elected president; Dr. Frank O. Johnson, Granite City, vice president; Dr. Edward W. Fiegenbaum, Edwardsville, secretary; Dr. Joseph A. Hirsch, treasurer, and Dr. M. William Harrison, Collinsville, medical director of the tuberculosis association.

Development of Public Charities.—Charles H. Thorne, director of public welfare, has recommended that five new state institutions be established: an institution for feebleminded near Chicago; a state sanatorium for women; a state farm for male misdemeanants; a surgical institution for children, and educational hospitals to perfect the training service. The appropriation required for the establishment of these institutions aggregates more than $1,500,000.

Chicago

Well Known Masseur Dies.—Hugo Ad Oldenborg, one of the first Swedish masseurs to come to this city, a man of exceptional ability and well esteemed by the medical profession of Chicago, assistant professor of kinesitherapy in Rush Medical College, secretary for many years of the Scandinavian Medical Society, died at his home, January 11.

Opium in Influenza Prescriptions.—The health department of Chicago has completed a survey of drug stores which has shown that during the height of the influenza epidemic, physicians made widespread use of medicine containing habit-forming drugs. Between Oct. 1 and Nov. 1, 1918, the survey shows that 741,825 prescriptions had been filled in 946 drug

stores in Chicago. Of these 441,641 were for influenza and pneumonia, and of the later 104,010 were found to contain narcotics, either opium, opium derivatives, cocain or chloral.

INDIANA

Deaths Exceed Births.—In Huntington, according to figures made public by the secretary of the city board of health during December, 1918, there were ten more deaths than births. The returns usually show about two births for each death. There were 29 births and 39 deaths. Of the deaths 23 were caused by influenza, 15 from pneumonia following or accompanying the influenza and eight were from other complications of influenza. Influenza deaths in the city were 3 in October, 8 in November and 23 in December.

Orphans Made by the Epidemic.—According to figures given out by the statistician of the state health department, influenza and pneumonia caused 6,011 deaths during the three months ending December 1. In September there were only 191 deaths from these causes, but in October there were 3,291, and in November 2,529. During the period named there were 2,773 deaths of married persons from the epidemic, and allowing an average of two children for each married person this would indicate that the disease made 5,546 orphans.

KANSAS

Personal.—Dr. George M. Gray, Kansas City, who has been acting as medical aide on the governor's staff, has resigned.

Full-Time Health Officer for Wichita.—In the 1919 budget for Wichita, provision is made for a full-time city physician at a salary of $3,000 a year. He will devote his entire time to the service of the city, including the maintenance of a free clinic.

New Officers.—At the annual meeting of the Shawnee County Medical Society, held in Topeka, January 6, Dr. Forrest L. Loveland was elected president; Dr. William M. Mills, vice president; Dr. Homer A. Alexander, secretary, and Dr. Lewis H. Munn, treasurer.

MARYLAND

Dr. Thayer Returns from France.—Brig-Gen. William S. Thayer, Baltimore, who has been serving in France, arrived at Newport News, Va., January 9, and has proceeded to report to Washington, D. C.

Annual Dinner of Health Department.—At the annual dinner given by the medical men of the Baltimore City Health Department in honor of Dr. John D. Blake, Baltimore, commissioner of health, addresses were made by Drs. John F. Hogan, William T. Howard, Bernard J. Wess, John W. France and Harry L. Kolseth, all of Baltimore. A round table discussion of suggestions for improvement of conditions in various city wards closed the program.

Personal.—Major Thomas R. Chambers, Baltimore, who has been stationed for the past nine months in France as a member of the Surgical Operating Squad, has arrived in Baltimore with orders to report to Camp Dix, N. J. Major Chambers was a member of the First Army Division while in France.——Dr. Charles A. Waters has returned to Baltimore from Camp Greenleaf, Ga., where he had been stationed for the past three months after returning from overseas service as a member of the Johns Hopkins Unit.

Health Department Denies "Flu" Report.—Dr. William T. Howard, Baltimore, assistant commissioner of health, has written to Dr. William H. Davis, chief statistician of the United States Bureau of Census, correcting a statement sent out from Washington that Baltimore had the highest death rate last year of any large city in the country. This city was credited with 15,999 deaths, or a mortality of 26.8 per thousand of population. According to the records of the health department, there were 15,120 deaths in the city in 1918, or fewer by 879 than the number given in a bulletin of the census bureau. Dr. Howard figures, therefore, that the city's annual death rate per thousand of population was 25.2. Furthermore, he corrected a published statement that Baltimore led forty-six large cities in the number of deaths from influenza during the epidemic. Philadelphia led these cities in deaths from influenza, with 7.4 per thousand of population. Pittsburgh came next with 6.8 per thousand, and Baltimore was third, with 6.5 per thousand. The influenza death rate in Boston was 5.5, while in Washington it was 5 per thousand. In Baltimore during the epidemic 1,624 persons died from influenza and 2,388 from pneumonia, which was epidemic at the same time. In Philadelphia there were 8,080 deaths from influenza and 5,295 from pneumonia. Pittsburgh had 1,989 deaths from influenza and 2,410 from pneumonia. In Boston there were 3,689 deaths from influenza and 1,099 from pneumonia.

MASSACHUSETTS

Beland to Speak in Worcester.—It is announced that Hon. Dr. Henri S. Beland, M.P., St. Joseph de Beauce, Que., who was a prisoner in Germany for three years, will speak in Worcester, January 26.

Personal.—Dr. William E. Chenery, professor of laryngology in Tufts Medical School, Boston, has been elected a member of the corporation of Boston University.——Drs. Clement H. Hollowell and Richard E. Winslow, Norwood, who were arraigned before the district court, Deadham, December 20, for alleged failure to report influenza cases, pleaded guilty and their cases were placed on file.——Dr. George Klein, Norwood, charged with having failed to report influenza cases, was found not guilty.

Sanatorium Enlarged.—The Central Sanatorium of New England, formerly the Crane Sanatorium, Rutland, is being enlarged so that it may care for a number of discharged soldiers and sailors in addition to the added number of civilian patients. The new sanatorium will be in accordance with the comprehensive plan to care eventually for hundreds or even thousands of patients suffering from tuberculosis. It is planned to provide occupational buildings for those patients whose condition allows them to be profitably employed.

Reprints on Diet and Child Welfare.—The Massachusetts State Board of Health has prepared in separate form a number of reprints of articles appearing in *The Commonhealth*, the monthly journal of the board, on dietary and other subjects, especially with reference to children, and also an outline for a course on child welfare. Among the subjects are "Food for the Child," "Energy-Producing Foods" and "Certain Dietary Essentials." These pamphlets are for general distribution, and are interesting contributions to the various subjects.

Influenza in Fall River.—The *Monthly Bulletin* of the board of health of Fall River for October, 1918, says of the epidemic of influenza: "That the disease was brought into this city through the medium of the members of the Army and Navy service of the United States is clearly shown by our records. Of the first cases reported, fourteen are classified as home on furlough or having been in the service as follows, and others reported were shown to have been visiting in some of these families: 1 from Quincy Shipyard; 1 from Newport Torpedo Station (yeowoman); 1 from Camp Upton, N. Y.; 1 from Newport Training Station; 1 from Newport (soldiers); 1 from Boston aviation service (British); 5 from Boston Navy Yard. In view of the subsequent suffering and death experienced during this epidemic it is to be regretted that the quarantine afterwards placed on all camps, forts and cantonments because of this disease was not recognized as necessary and put into effect before it obtained a foothold in Fall River."

NEBRASKA

Personal.—Dr. Clifford W. Waldon has been appointed city physician of Beatrice, to succeed Dr. G. L. Roe, who has resigned.

Hospital Notes.—A movement has been inaugurated at Kearney for the erection of a large hospital, the building to cost about $100,000. It is understood that there is already $50,000 for the project.——Work is progressing rapidly on the new Lutheran Hospital, Beatrice. It is believed the building will be ready for occupancy by June. When completed the hospital will be able to care for 100 patients.

Smallpox.—City Health Commissioner Ernest T. Manning of Omaha says the smallpox record of that city for 1918 is a disgrace. In a comparative statement of infectious diseases for the year he shows that there were 1,009 cases of smallpox, 651 cases of measles, 427 of diphtheria and 412 of scarlet fever. This preponderance of smallpox cases, he says, is due to lack of vaccination, which should be made compulsory.

NEW HAMPSHIRE

State Health Meeting.—A meeting of the health officers of the cities of the state was held in the Representatives' Hall in the State House, Concord, January 17 and 18. After-war health problems, school hygiene, influenza, venereal disease control and tuberculosis were the chief topics of discussion.

State Antituberculosis Society.—The annual meeting of directors of the New Hampshire Society for the Prevention of Tuberculosis was held in Manchester, recently and Dr. Clarence O. Coburn, Manchester, was elected president; Dr. Herbert L. Smith, Nashua, honorary vice president; Dr. Robert B. Kerr, Pembroke, executive secretary, and Drs. George H. Clarke, Concord; Forrest L. Keay, Rochester; Robert B. Kerr, Pembroke; Frank E. Kittredge, Nashua; William E. Lawrence, North Haverhill; Elmer M. Miller, Woodsville; George P. Morgan, Dover; John H. Neal, Portsmouth; Herbert L. Smith, Nashua; Ellen A. Wallace, Manchester; Charles A. Weaver, New Boston; John M. Wise, Glencliff, Charles Duncan, Concord, and Frederick P. Scribner, Manchester, were elected members of the board of directors.

NEW JERSEY

Tuberculosis Survey.—The health authorities of Atlantic City have arranged to have a tuberculosis survey made in the city, having especially in view the detection in their incipiency of cases of tuberculosis following attacks of influenza. A careful inspection of every recovered victim will be made and those showing signs of tuberculosis will be advised as to the proper course to pursue for their own protection as well as that of their families. It is within the discretion of the health department to order the isolation of patients when it is necessary for the safety of the public. Patients may be ordered to the county camp at Pine Rest.

Personal.—Dr. John A. Beek, Gloucester City, who resigned his position as city physician and health inspector to enter the Army, has been discharged and has returned home.——Dr. Henry B. Dunham, for ten years assistant superintendent and examining physician of New Jersey State Sanatorium for Tuberculosis, Glen Gardner, has been selected as superintendent of the Essex County Hospital, Soho, and Essex Mountain Sanatorium, Verona.——Dr. George W. Endicott, Plainfield, who has been seriously ill at his home, is reported to be improving.——Dr. and Mrs. Thomas H. Tomlinson, Plainfield, celebrated their fiftieth wedding anniversary, December 30.——Dr. J. Alan Maclay has been appointed a member of the board of health of Paterson.

NEW YORK

Officers of Mount Sinai Unit Return from France.—Lieut.-Col. Howard Lilienthal, M. C., U. S. Army, who has been in command of Army Base Hospital No. 3, near Bordeaux, arrived at Newport News, January 4.——Major Edwin Beer of the Mount Sinai unit has also returned home.

Personal.—Dr. Addison T. Halstead, Rushville, has been appointed deputy drug commissioner of the state, with headquarters in Albany.——Dr. Otis Z. Bouton, Fultonville, has been appointed coroner for Montgomery County to fill the unexpired term of the late Capt. Stephen J. H. Reed, Fultonville.——The City Club of Yonkers will tender a testimonial dinner to Dr. Nathan A. Warren, in recognition of the completion of seventeen years of service as president of the club.

Health Insurance Measures.—The first bill for 1919 to be introduced into the New York State Senate was one providing for the reorganization of the New York State Health Department which was submitted by Senator Ross Graves of Buffalo. This bill was introduced at the request of the Associated Manufacturers and Merchants of the state and is regarded in some quarters as a check to the propaganda for compulsory health insurance, though its sponsors deny this and state that the bill stands squarely on its own merits. The bill provides for an organized system of sickness prevention and carries an appropriation of $2,250,000. It is not expected that the bill will be passed at the present time, but it is regarded as a start in the right direction. January 8, a health insurance bill was introduced into the lower house by Assemblyman Joseph Steinberg of the Fifteenth Manhattan District. This bill provides for a system of mutual health insurance funds under the supervision of the Industrial Commission. It aims to supplement the inadequacies of the present Workmen's Compensation Law and provides for maternity benefits. The costs of the insurance are to be borne one half by the employer and one half by the employee. In cases in which the earnings of the employee are less than $9 a week and more than $5 they are to be borne three quarters by the employer and one quarter by the employee. The bill not only provides for health insurance, but also for prevention of disease by lessons in hygiene. An appropriation for this purpose is to be made with the consent of the Industrial Commission. Governor Smith is said to be ardently in favor of the bill and public sentiment is also supporting the measure.

New York City

Harvey Society Lecture.—The third lecture of the Harvey Society series will be delivered at the New York Academy of Medicine, Saturday, Jan. 25, 1919, at 8:30 o'clock, by Major R. M. Yerkes on "Psychological Examination of the Soldier."

Farm Given Medical College.—The Long Island College Hospital has been given a farm for keeping animals used in research, by an anonymous benefactor. Experimental work has already been begun on fowl influenza, diphtheria and chickenpox.

Personal.—Dr. Simon Flexner, director of laboratories of the Rockefeller Institute for Medical Research, has been elected a corresponding member of the Societé Médicale des Hôpitaux de Paris, and has had the title of Officier de la Legion d'Honneur conferred on him by the French government.

Physicians' Association Election.—At the annual meeting of the New York Physicians' Association the following officers were elected: president, Dr. Israel Grushlaw; vice presidents, Drs. James Morley Hitzrot and Samuel Kleinberg; secretary, Dr. Morris Grossman, and treasurer, Dr. Alfred M. Hellman. At the next meeting to be held at the Chemist's Club, January 23, Dr. Solis Cohen, Philadelphia, will read a paper entitled "Lessons from the Two Grippe Pandemics."

OREGON

New Officers.—At the annual meeting of the Portland City and County Medical Society, December 18, the following officers were elected: president, Dr. Charles J. Smith; vice president, Dr. Chester C. Moore; secretary, Dr. Andrew J. Browning, and treasurer, Dr. Katherine C. Manion.

Merging of Health Agencies Urged.—The State Consolidation Commission is recommending the creation of an office of director of public health and the consolidation of the present health agencies with the department. The recommendations made are ten in number, and are as follows:

First.—Creation of the office of director of public health, who shall be appointed by the governor, and be the executive health officer of the state.

Second.—Creation of an advisory nonexecutive public health council of seven members, appointed by the governor, and of which the health officer shall be ex-officio chairman.

Third.—That the Oregon Social Hygiene Society assume charge of the division of venereal diseases under that director.

Fourth.—That the Oregon Tuberculosis Society be authorized to assume charge of the tuberculosis division.

Fifth.—That the child welfare commission be given charge of the child welfare division.

Sixth.—That a deputy health officer be put in charge of the bureau of medical registration and licensure.

Seventh.—Consolidation of the laboratories of the state health department, the dairy and food commissioner, medical school of the University of Oregon, Multnomah county, and the city of Portland.

Eighth.—That a deputy appointed by the director be given direction of the bureau of food and dairy products.

Ninth.—An annual fee to be paid to the state by all licensed members of the health professions.

Tenth.—That all funds appropriated for health work be put under the jurisdiction of the director of public health, and by him apportioned among the various bureaus in his department.

PENNSYLVANIA

Philadelphia

Motion Pictures Aid Clinic.—Teaching surgery and medicine with the aid of motion pictures was demonstrated to the county medical society in Scottish Rite Hall, January 9, by Col. William O. Owen, M. C., U. S. Army, curator of the Army Medical Museum at Washington, who showed several of his "animated charts."

Women Interns for Hospital.—Beginning June 1 and for the first time in the history of the University of Pennsylvania, women physicians will be acepted as interns in the University Hospital. The only restrictions being that there shall be but two women physician interns at one time and that both shall be medical graduates of the University of Pennsylvania.

Influenza Survey Begins.—January 13, members of the Emergency Aid will begin a survey of the homes of the 4,000 women and children who suffered from the influenza last autumn to determine whether they are still in need of attention. This data will then be turned over to the Visiting Nurses' Society.——Influenza during the week ended January 9 had increased, 383 new cases having been recorded.

Social Education Conference.—A social education conference under the auspices of Department No. 10, Health Recreation, Women's Division, Council of National Defense and Women's Section Social Hygiene Division, Commission on Training Camp Activities of the War Department, was held at the Ritz Carlton Hotel, January 6 and 7. Among the speakers were Dr. Wilmer Krusen, director of public health and charities, Dr. Josephine H. Kenyon and Dr. Ellen C. Potter.

Personal.—Lieut. William H. Walsh, M. R. C., has just been made general medical inspector of the Children's Hospital, to be established near Mons, Belgium.——Capt. Frederick S. Baldi, M. R. C., who was attached to the Marine Aviation Corps and the Bombing Squadron, actively engaged around Dunkirk, has returned to this city.——Dr. Elwood L. Drake, Bridesburg, is in a serious condition as the result of injuries sustained by being thrown from his automobile in a collision, January 4.

SOUTH CAROLINA

Influenza.—The report of the officer of the Public Health Service sent to cooperate with the state health authorities in carrying out measures in the epidemic of influenza from September 21 to the first of the year indicates that about 10 per cent. of the entire population of the state suffered from the disease. The number of deaths was said to be about 5,000.

VIRGINIA

State Board Can Supply Physicians.—Dr. Ennion G. Williams, Richmond, state health commissioner, announces that the state board of health is now able to aid communities in need of physicians, since many physicians are now being separated from the Army.

Personal.—Dr. Roy K. Flannagan, city health officer of Richmond, has resigned, the resignation taking effect January 15. Dr. Flannagan has been offered the position of representative of the International Health Board for Virginia.—— Dr. Thompson F. Wickliffe has succeeded Dr. James S. Mitchener, Kingston, resigned, as health officer of Lenoir County.

WYOMING

Influenza.—January 1, it was reported that there were on the previous day 300 cases of influenza in Jackson's Hole and that there had been five deaths during the preceding twenty-four hours. Dr. Charles W. Huff, the only physician in the valley was still confined to his home with the disease, and there were several other cases in his family.

CANADA

Influenza Expedition.—A dog team expedition has left Dawson, Yukon, on a trip of 500 miles, with supplies, medicines and masks for combating influenza among the Indians and Eskimos in that remote region. It was dispatched by the Commissioner of Indian Affairs, Ottawa, Canada.

New Hospital for Orillia.—Orillia, Ont., wants to have a new hospital as a memorial to soldiers. Already $60,000 has been raised by private subscription. Altogether $100,000 is required for the purpose; and recently a deputation waited on the Ontario government officials in Toronto to seek provincial assistance. Any soldiers who enlisted from Orillia, or who ever lived there, shall be given free surgical and medical assistance and hospital treatment as long as he lives.

Public Health News.—During the past three months influenza and pneumonia were responsible for 7,158 lives in the province of Ontario. The death rate was the highest in October when 3,105 succumbed to the malady.——There was an alarming increase of the number of cases of venereal diseases in Ontario in December as compared with November: syphilis, December, 64; November, 17; gonorrhea, December, 110; November, 75; chancroid, December, 4; November, 2. One death resulted from syphilis.——In Toronto the number of deaths in 1918 exceeded those of 1917 by 2,009—the total for the former year being 7,060 and for the latter, 5,597. The deaths from influenza and pneumonia numbered 2,067.—— Brantford, Ont., will appoint a whole-time officer of health and a pathologist.

Mental Disease Great Menace.—In the Convocation Hall of the University of Toronto, Major Frankwood E. Williams, New York City, M. C., U. S. Army, recently gave an address under the auspices of the Canadian National Committee for Mental Hygiene. He doubted if many had a true conception of the problem presented by mental diseases. He gave figures for New York state and Massachusetts showing that 6,000 new cases enter the hospitals in the former every year and 3,000 every year in the latter. He considered prevention rather than cure the essential way to handle the problem. The United States Army officers have learned from Canada and Great Britain that mental diseases and nervous diseases present a large problem in all armies. The problem must be tackled on the ground of prevention if they wished to get at the root of the matter, and the persons with mental or nervous diseases should be studied as individuals and not as criminals. When they were understood, protected and advised they could get along on their own level in any community.

Personal.—Captain Greenlees and Lieut. John Stenhouse, Toronto, have been transferred to the Ontario Military Hospital, Coburg, Ont.——Surg.-Gen. G. A. Sterling Ryerson, Toronto, has resumed practice in diseases of the eye, after four years in Canadian Red Cross work—a society of which he is the founder in Canada and a past president. During the course of his work he has visited France and England, Quebec and Vancouver, Los Angeles, southern California and Sitka, Alaska. He also spoke in several points in the Eastern states.——Lieut.-Col. Charles S. McVicar, Toronto, is mentioned for the position of commanding officer for the Central Orthopedic Military Hospital.——Col. P. Walter H. McKeown, O. C., Brighton Military Hospital, England, is expected to return to Toronto in March.

GENERAL

Bequests and Donations.—The following bequests and donations have recently been announced:

For the establishment of a home for convalescents at her residence in Payne Township, Chester County, Pa., including a large park, $250,000 by the will of Mrs. Florence Hatfield.

Mt. Sinai Hospital, Chicago, $25,000 as the result of a recent tag day and emergency fund drive.

Chicago Lying-In Hospital, $20,000, and trust funds for the maintenance of beds in the Chicago Lying-In Hospital, the proceeds of a performance of the Great Lakes revue.

Internal Medicine Congress.—At the annual meeting of the American Congress on Internal Medicine, held in New York City, December 31, the following officers were elected: president, Dr. Glentworth R. Butler, Brooklyn; vice presidents, Drs. Frederick Tice, Chicago, and Clement R. Jones, Pittsburgh; secretary-general, Dr. Frank Smithies, Chicago; associate secretary-general, Dr. Joseph H. Byrne, New York City, and treasurer, Dr. Augustus Caillé, New York City.

Influenza in the Large Cities.—In the forty-six largest cities of the United States the epidemic of influenza in the latter part of the year 1918, according to figures of the U. S. Census Bureau, made public, January 5, there were 111,688 death from this disease, which increased the combined death rate for those communities to 19.6 per thousand. Deaths from influenza were 69,439, with 42,149 deaths from pneumonia. The general influenza situation during the past week shows not much change from that of the previous week. In some communities a good many cases have appeared and restrictions have been continued, while in others the disease seems to be slowly subsiding and school and other restrictions are relaxed.

Welfare Work for 1919.—It is announced by the Rockefeller Foundation that the public health activities to be carried out during 1919 will consist chiefly of efforts against yellow fever, tuberculosis in France and malaria and hookworm disease in this and other countries, together with the completion of the war program already undertaken. The yellow fever commission is headed by Major-Gen. William C. Gorgas, who is now in South America in the interest of the work of the commission. The work on tuberculosis in France in cooperation with the American Red Cross will be continued at the request of the French government. The hookworm campaign will be continued in twelve states of this country and in twenty-one foreign states and countries. There are various other studies and investigations being carried on. An important feature of the work of the foundation is the development of training in modern scientific medicine in China, centers for which are almost ready for opening in Peking and Shanghai, in addition to the assistance given medical organizations already established throughout China. At the request of the War Department the War Demonstration Hospital will be continued, as will also the work of the Medical Division of the National Research Council, appointed by the President to coordinate the scientific resources of the nation, and the care and treatment of soldiers mentally and

nervously disabled. The estimated income of the fund in 1919 is $6,750,000, of which about $2,250,000 will be for public health and somewhat over $3,500,000 for medical education.

FOREIGN

Fifth Interallies Food Supply Conference.—Four meetings of the scientific commission appointed for this purpose have been held, two at Paris, one at London and one at Rome, and the fifth has recently been under way at Rome.

Foreign Physicians in Spain.—The *Revista de Medicina y Cirugia Practicas* recently mentioned that since 1906 about sixty foreign physicians have been licensed to practice medicine in Spain. They are mostly German, English and North American physicians.

Bequest for Tuberculosis Hospital at Rome.—The rector of the University of Rome has accepted the bequest made by the late American princess di Vicovaro for the foundation of a modern hospital for the tuberculous, to be called the Eleonora (Lorillard) Spencer Cenci Hospital.

Organization of Insane Asylums and Colonies in the Netherlands.—The *Nederlandsch Tijdschrift* reports that all institutions that care for mental disease in the Netherlands —except the Roman Catholic—have recently organized, with headquarters at Utrecht, seeking to obtain better terms for supplies of various kinds. The medical department is not represented in the organization, as its aims are exclusively administrative.

Italian Institution for the Nervous Wrecks of the War.—Subscriptions have been collected and Senator Borletti has donated a handsome villa with extensive grounds near Milan for an institute to care for the *grandi invalidi nervosi* who need special and continuous attendance. The president of the association having the matter in charge is Prof. C. Golgi, who is also senator, with Prof. E. Medea as the medical chief of the new institution.

Medical and Welfare Activities in Italy.—According to the Italian News Service, committees have been formed in all the more important cities of Italy for the immediate relief and care of the children of soldiers and sailors crippled in the war. The children will be cared for, clothed and fed, and in the summer, according to the advice of physicians, will be sent to villas requisitioned or donated at the seashore or in the mountains.——A decree conferring power on the mayors of cities to fix maximum prices of medicines most in use has been issued. Heavy penalties have been provided for disregard of the regulations—fines up to $200, imprisonment for a year, and even requisition of the shops of pharmacists.

Pensions for Physicians Disabled in the Practice of Their Profession.—A bill was recently presented in the Spanish senate providing that disability contracted by any physician in the exercise of his profession should be considered as an occupational accident, and the widow and orphans of those who have died in consequence of inoculations and contagions professionally acquired should be entitled to an annual pension. The amount of the pension specified is 2,000 pesetas in towns of 200,000 inhabitants or over, and 1,000 pesetas in towns of less than 10,000 inhabitants, with intermediate amounts. The *Medicina Ibera* states that the bill was presented by Sr. O. Morejon and that the ministro de la Gobernacion is now considering it.

Prizes Awarded by the French Academy of Science.—Seven prizes for research in medical subjects were among those awarded at the recent annual meeting of this organization. One was given to Drs. Cardot and Laugier for their research on the electric stimulation of nerves; one to Dr. S. Chauvet for his monograph on pituitary infantilism; one to Prof. R. Dubois of Lyons for his works on physiology; another to Dr. H. Clement for his research on the action of centrifugation on living cells and living beings. One prize was divided between Nageotte and Sencert for their successful transplantation of dead tendons to repair gaps in tendons, and Drs. P. Duval and A. Grigaut for their research on traumatic shock. The Fanny Emden prize was not awarded but at the request of the donor the arrearages of the prize were given to the widow of Prof. A. Dastre, who was killed in Paris not long ago by a military automobile.

Demobilization of the Profession in Germany.—The *Paris Médical* relates that at the recent annual meeting at Eisenach of the delegates representing the organized profession, the Aerztetag, resolutions were adopted asking the authorities to demobilize first the older physicians, the married, and those who have been longest in the service. Also to appoint the medical officers in the army to points in or near their homes, and to reserve the posts of assistants in the universities for men returning from the front. Free graduate courses for those who desire them were also asked for, as well as special measures for disabled physicians. Another resolution asked that the instruments and automobiles released by the close of the war should be sold to physicians at moderate prices, without middlemen. It was also asked that no permission should be granted for foreign physicians to practice, especially at spas. The concluding resolution asked that circulars should be distributed explaining to the public how it is to their interest to return to their before-the-war physician.

Deaths in the Profession Abroad.—Prof. **B. Krönig,** director of the maternity and the clinic for women's diseases at the University of Freiburg, known best for his "twilight sleep" and intensive roentgen treatment of uterine cancer. ——Prof. **P. Jung** of the chair of gynecology and obstetrics of the University of Göttingen, aged 48.——Prof. **P. Kroemer** of the chair of obstetrics and gynecology at the University of Greifswald.——Dr. **H. Lohnstein** of Berlin, editor of the *Allg. med. Zentralzeitung* and of the *Zeitschrift für Urologie*, aged 53.—— Dr. **A. Helweg,** a prominent psychiatrist of Copenhagen, aged 60.——Dr. **J. Eriksen,** a Danish ophthalmologist at Cairo where he served as consul for Denmark, aged 46.——Dr. **F. Sierra y Zafra,** physician in chief of the public hospital system at Madrid, aged 64.——Dr. **S. Pizjuan,** professor of surgery at the University of Sevilla, president of the Real Academia de Medicina and author of "De Re Clinica."——Dr. **J. V. C. Ingerslev,** a Danish physician who compiled the "History of Medicine in Denmark," and was the initiator of relief work in the profession in Denmark, aged 83.

Personal.—Prof. A. Sclavo of Siena has been called to the chair of hygiene at Florence as successor of Professor Roster who recently retired on reaching the age limit. Professor Sclavo has been a leader in matters of hygiene in Italy for years; has been active in organizing the training of sanitary officers in the army. He was also active in the organization of the prophylaxis of tuberculosis in the army.—— The chair of anatomy at Rome, left vacant by the recent death of Prof. F. Todaro, is now filled by Prof. R. Versari of Palermo and Naples, known for his research on the anatomy of the bladder and on the embryonal circulation in the eye.——The University of Rome is said to have lost 235 of its students on the field of battle.——Prof. V. Bie of Copenhagen has recently been elected president of the Copenhagen Medical Society and consequently—according to the by-laws of the Danish Medical Association—this disqualifies him from serving as editor of the organ of the association, the *Ugeskrift for Læger*. He has therefore resigned the editorship which he shared with Dr. V. Scheel, and the latter assumes the entire responsibility for this important weekly.——Prof. F. Battistini of the chair of medical pathology at Turin, is recovering from a serious automobile accident.

SOUTH AND CENTRAL AMERICA, MEXICO AND WEST INDIES

Deaths in the Profession.—Dr. **V. M. Sotolongo y Lynch** of Havana, one of the founders of the *Abeja Medica*.—— Dr. **J. B. Pons,** director of the first national sanatorium for the tuberculous in Cuba during its earlier years, and secretary of the Association of the Medical Press in Cuba.—— Dr. **R. S. Gomez** of Buenos Aires, professor of internal pathology and descriptive anatomy at the University of Buenos Aires, and surgeon in chief of the Rivadavia hospital, aged 40.——Dr. **J. N. Acuña,** director of the schools of Buenos Aires, senator, at one time minister, and representative of Argentina in various international gatherings, aged 66.

Donation from Argentine Physicians for the War Fund of French Physicians and Their Widows and Orphans.—A committee was organized among the physicians of Argentina to collect subscriptions for the war fund for relief of physicians and the widows and orphans of physicians in France. The *Prensa Medica Argentina* gives a list of all who subscribed and the amounts, two giving 500 pesos each, one 300 pesos and about a dozen 200 pesos, others giving from 100 down to 5 pesos each. A total of 16,800 pesos was thus contributed, which was recently presented to the French minister at Buenos Aires, and a little cash added, bringing the total to 41,579 francs. The official name of the French Medical War Fund is the Caisse d'assistance médicale de guerre, and associated with it is the Secours de guerre à la famille médicale, both of which are under the patronage of the president of the republic.

CORRECTION

Incorrect Address.—In the article by Hall, Stone and Simpson, entitled 'The Epidemic of Pneumonia Following Influenza at Camp Logan, Texas," published in THE JOURNAL for Dec. 14, 1918, page 1986, the address of Captain Simpson is incorrectly given as Hamburg, Ark. The correct address is Norristown, Pa.

MEXICO LETTER

MEXICO CITY, Jan. 5, 1919.

Mortality from Influenza

According to statistics approximately estimated, the epidemic which has just passed over the country caused 436,000 deaths.

Death of Dr. Barajas

The recent death of Dr. Carlos Barajas is a distinct loss. He was a prominent physician, professor of anatomy in the Facultad de Medicina and also in the Escuela Nacional Preparatoria; was the author of various works of a general literary character and had started the publication of a manual of anatomy. He was also a popular lecturer and carried on an intelligent propaganda for the cause of the Allies. The government of the French Republic awarded him the "Palmas Academicas," and Sr. Viscomte Dejean, chargé d'affaires for France, presided at the funeral ceremonies.

The Association for Prophylaxis of Blindness

This new association has been doing good work, distributing circulars on the hygiene of the eye; has organized lectures by prominent ophthalmologists, and is planning a free dispensary for the care of eye affections. The association has collected by private subscription 11,000 pesos to defray its expenses.

Aid for the Red Cross

The postoffice authorities have placed on sale a special stamp that sells for more than the ordinary stamp, and the proceeds to be derived from this extra amount are to be handed over to the Mexican Red Cross. The public telephones installed in the postoffice, the use of which heretofore has been gratuitous, now bear a notice that a fee of at least five cents must be paid for each conversation over the telephone, and the sum thus realized will also be turned over to the Red Cross. The Red Cross has elected Sr. C. Hinojosa, director general of the postoffice service, an honorary official of the society in token of recognition of these services.

North American Medical Literature

The use of medical books published in English is beginning to be more common in Mexico. In three months the agent of a Philadelphia publishing house has obtained orders for more than $1,000 worth of medical books, and the interest is so great that certain physicians have joined classes in English in order to be able to read the works of the United States writers which are regarded here as excellent.

A Spanish View on German Science After the War

In a recent interview, the great histologist, Professor Cajal of Madrid, commented on the way in which military medicine and surgery has been dominating the medical literature of the world since the war began. Bacteriology is cultivated so that epidemics may be warded off. He remarked, "No one knows what has been going on in the Central Empires. Since 1915 they have been shut off absolutely from scientific communication with the rest of the world. It is probable, however, that the subjects related to the war predominate there also. I am convinced," he continued, "that when the war is over the rancor between the scientists of the opposing forces will continue. There will be much injustice and much silence. This will be the case much more than after the war of 1870; even then the scientists of France and Germany held aloof from each other for many years. But now the hatred of the savants of the Entente for those of German blood will be enormous, and will last a long time." He was asked whether they would be justified in this. To this he replied: "Unjustified from the scientific standpoint; justified as the punishment of Germany (justificada como escarmiento de Alemania). German science has lost its place in the front rank in this war. Now it is the United States which with incredible swiftness is marching toward the head of the line in science and in world progress." This interview forms the forty-eighth chapter in a biography of Cajal recently published at Madrid by A. del Olmet and J. Torres Bernal.

LONDON LETTER

LONDON, Dec. 18, 1918.

The Last Struggles of the Army Medical Corps

In following the great British advance, which began, August 8, and continued for three months until the armistice was declared, the Medical Corps encountered great difficulties. Passing through the devastated country from Amiens to Le Cateau, the field ambulances and casualty clearing stations struggled to keep up with the fighting troops. As these pushed on faster and faster, the distances the wounded had to travel grew longer and longer. Moreover, although the attack was opened by one army, all the other armies were soon engaged, rendering impossible any interchange of surgical help. Although the casualty clearing stations traveled with less and less equipment, they never moved forward quickly enough, as adequate transport could not be obtained. As the advance became more rapid, the medical arrangements grew progressively simpler; the wounded had to be carried longer distances before operation, which seriously diminished their chances of benefit, even had the number of medical officers been sufficient to cope with all the cases. Moving ever forward and continually reducing their equipment, the accommodation of the casualty clearing stations was inadequate for the number of wounded coming from the field ambulances. Marquees often had to be pitched in a summary way, and when the weather grew colder the difficulty in getting fuel and enough blankets was great. Another trouble was that there were no disinfectors adapted for traveling on shell-wrecked roads. Owing to destruction of railway lines, the ambulance trains could not reach places where they were most wanted. When, November 11, hostilities ceased, the troubles of the medical service grew worse. The troops advanced without fighting, and the medical units had to push on behind them even faster than before; the clearing stations grew still lighter in equipment and weaker in medical officers. It was thought that because there were now no fresh wounded, the work would become much lighter. But in a few days there came toward the medical units a growing stream of released prisoners of all the allied nationalities abandoned by the Germans—underclad, unfed, many very ill, and all verminous. There also came an endless stream of influenza patients, many with severe attacks. Thus over bad roads, broken up by the ceaseless traffic of heavy motor lorries, the sick had to travel in motor ambulances through desolated country sometimes for five days before they could reach a railhead, and there the clearing stations were often so crowded that only the most severely ill could be retained. Here and there buildings could be found for clearing stations, but in many places the patients had to be housed in marquees hastily pitched on the mud.

Lead Poisoning of Children in Australia

It is curious that experience with lead poisoning in children is almost entirely derived from Australia, and that the literature on the subject is almost confined to Australian medical journals. The children are poisoned by handling painted fences, railings, etc. So serious is the danger that a deputation of the Queensland branch of the British Medical Association recently waited on the home secretary, asking him to include a clause in the bill to amend the health act dealing with the use of lead in paint on surfaces within the reach of children. Later a deputation of representatives of the Master Painters and Decorators Association waited on the home secretary to answer statements made by the British Medical Association. Finally a conference was held between the two bodies, and the following representations were made to the home secretary: 1. In order to prevent lead poisoning in children, it is necessary to prevent the powdering of lead paint within their reach. 2. As the powdering occurs on fences, palisadings and veranda railings exposed to the weather, it is necessary to use a paint for these surfaces that does not easily powder. 3. A paint should be used that is manufactured on a base of not greater than 60 per cent. of lead carbonate and not less than 40 per cent. of zinc oxid. Such paint should be ground by the manufacturer, either in paste or liquid form, and must bear the manufacturer's guarantee to the effect that it complies with this regulation. 4. The vehicle used in such paint should be a mixture of genuine pale boiled oil (linseed) and genuine raw linseed oil. 5. The surfaces specified above, and within the reach of children, must be painted every three years, in order to prevent powdering. It would be advisable that these surfaces be washed down annually. 6. The total prohibition of white lead is unnecessary.

The Treatment of Venereal Diseases

In a previous letter to THE JOURNAL, the precautions to be taken on demobilization to prevent the spread of venereal diseases to the civil populations were mentioned. The government has now opened negotiations with the naval and military authorities for the release from the army and navy of physicians experienced in the treatment of venereal diseases. It urges local authorities to arrange more frequent clinics at existing venereal disease centers by arrangement with the voluntary hospitals and otherwise, to hold evening clinics, if this is not at present done, and to provide many additional centers. The aim is to provide a center in every town with a population of more than 20,000. The appointment of whole-time venereal disease officers is urged. These officers should have considerable experience in modern methods and be under the supervision of the health officers. When necessary, part-time clinical assistants would be provided or a rota of physicians with special experience.

Drink Control

The shortage of food during the war led to great restriction in the production and consumption of alcoholic drinks. The effect on the amount of intoxication formed the basis of a paper by Lord D'Abernon, chairman of the Central Control Board (Liquor Traffic) on the causes of drunkenness. It might be supposed that excessive drinking is mainly due to bad environment, such as bad housing, insufficient amenities for food and refreshment, absence of healthy recreation, excessive number of saloons, and custom; or, on the other hand, that drinking is due to morbid predisposition of the individual. The importance of environment is shown by the statistics given in the accompanying tables, which contrast the positions before and after the drink traffic was controlled as a war measure. Thus, under a

EFFECT OF CONTROL OF DRINK TRAFFIC

Year	Convictions for Drunkenness	Deaths from Alcoholism, Excluding Cirrhosis of the Liver	Deaths from Cirrhosis of the Liver	Deaths from Suffocation in Infancy
1913	35,765	719	1,665	1,236
1914	37,311	680	1,773	1,233
1915	33,211	584	1,525	1,021
1916	21,245	333	1,163	744
1917	12,307	222	808	704

CASES OF DELIRIUM TREMENS TREATED IN CERTAIN POOR LAW INFIRMARIES (WOMEN ONLY)

	Number of Cases
Prewar, 1914-1914	214
Precontrol, 1914-1915	239
First year of control, 1915-1916	121
Second year of control, 1916-1917	45

system of regulation of the conditions of drinking, reinforced by such indirect influences as the provision of canteen facilities, drunkenness in women, as compared with the year 1913, had been reduced by 60.6 per cent., their mortality from alcoholism and from cirrhosis of the liver had decreased by 69.1 per cent., and 51.5 per cent., respectively; the frequency of delirium tremens in women had fallen by 79 per cent., and the deaths from suffocation in infancy by 42.6 per cent. An even greater falling off had been brought about, within the same period, in the drunkards amenable to the inebriates acts. Thus, the number of persons proceeded against for habitual drunkenness in England and Wales in 1913 amounted to 332, but was only 27 in 1917. The admissions to inebriate reformatories similarly declined from 310 to 29—a result, however, to which other factors perhaps contributed.

PARIS LETTER

PARIS, Dec. 5, 1918.

Heteroplastic Nerve Grafts

Dr. G. Roussy and Dr. A. Reverdin reported to the Société de neurologie their results from the use of heteroplastic nerve grafts according to the method of Dr. Nageotte, i. e., using pieces of nerves removed from dead-born calves, the grafts having previously been fixed in alcohol. Roussy and Reverdin treated the following cases in this manner: (1) A case of paralysis of the internal popliteal nerve, the result of complete division of the nerve, in the middle portion of the thigh, with separation of the ends for a distance of 5 cm. (the external popliteal being intact). After freshening the two ends of the nerve, a nerve graft, measuring 20 cm. in length, taken from the sciatic nerve of a dead-born calf, was interposed. (2) A case of complete division of the ulnar nerve in the axilla, with a separation of several centimeters and a cicatricial neuroma on each end of the nerve. A 10 cm. long nerve graft, taken from a dead-born calf, was interposed. (3) A case of division of the ulnar nerve, associated with causalgia of the median, the result of a wound in the middle third of the arm. A graft, 5 cm. long, from a dead-born calf was interposed. (4) A case of neuroma of the ulnar from a wound in the forearm which would not permit of the conduction of impulses through the nerve. The neuroma was resected, the ends of the nerve were freshened, and a 5 cm. graft from a dead-born calf was interposed.

These operations, the first of which was performed only nine months ago, are still too recent to permit of judging of the functional results which may follow from this procedure. However, it can be stated that the grafts are tolerated perfectly by the tissues. In no case has any local reaction manifested itself, and the wounds healed by first intention.

Medical Examinations

The minister of public instruction has addressed a communication to the rectors of the universities authorizing them to make a concession to medical students who have been called twice for the same examination at the end of the year in only one subject so that they do not need to take again the work of the entire year. These students will be permitted to continue their course of study without conditions until the March semester. But, in the event of another failure, the work done under this permission will be declared void and the whole year's work must be done over again.

Reorganization of the University of Strasbourg

The important question of the reorganization of collegiate teaching in Alsace and Lorraine is receiving the consideration of M. Lafferre, minister of public instruction. He has appointed a commission consisting of the deans of the faculties of science and arts, of savants and of professors, who will visit the scientific institutions, the faculties and the laboratories in these two provinces and report on the present condition and the needs of these institutions. A plan of reorganization of the University of Strasbourg will be submitted by this commission. The members of this commission are: MM. Paul Appell, dean of the faculty of science of Paris; Haller, director of the Ecole de physique et chimie and member of the Academy of Sciences; Haug, professor in the Sorbonne, member of the Academy of Sciences; Professor Roger, dean of the medical faculty of Paris; Guillet, professor in the Paris science faculty, etc. Nearly all the members of the commission were originally Alsatians. The mission will visit Strasbourg, Metz and Mulhouse, taking about ten days for the trip.

Admission to Hospitals of Progressive Cases of Tuberculosis

The under-secretary of state for the Service de Santé militaire has directed that all men with active tuberculosis, open or closed, can be admitted to the sanatorium hospitals, except the advanced hectic fever (mixed infection) and advanced cavity cases. Other tuberculous patients who should not be sent to these hospitals are (1) those suspected of having the disease and whose cases can be diagnosticated and disposed of in the centre de triage (evacuation hospital), or by consultation with the physician of the sector; (2) cases of pleuro-pulmonary sclerosis, the results of an old, long healed tuberculous process without any manifest or detectable symptoms, which can also be disposed of as the cases first mentioned.

Marriages

JOHN THOMAS PAINE WICKLIFFE, Lieut., M. C., U. S. Army, Lebanon, Ky., to Miss Elizabeth Wolfe of South Carrollton, Ky., December 31.

EVERETT MORRIS, Capt., M. C., U. S. Army, to Miss Helen Bernedine Freer, both of Chicago, at New Haven, Conn., December 21.

ARTHUR EUGENE BILLINGS, Philadelphia, to Miss Mary Packard of Villanova, Pa., at Rosemont, Pa., December 23.

CHARLES CLIFFORD MACKLIN, Pittsburgh, to Miss Marge DeGrofft Thurlow, at Philadelphia, September 17.

FRANK THEOPHILE BEATROUS, New Orleans, to Miss Grace Phyllis Hayne of Boyce, La., December 26.

LASALLE ARCHAMBAULT, Albany, N. Y., to Miss Yvonne Archambault of Montreal, Que., December 26.

RAPHAEL SCHILLINGER, Brooklyn, to Miss Selma Lille of New York City, December 22.

Deaths

Henry Lincoln Dearing, Braintree, Mass.; Bellevue Hospital Medical College, 1890; aged 52; a member of the Massachusetts Medical Society; a member of the Association of Military Surgeons of the United States; a member and secretary of the local school board from 1882 to 1899; a member of the local board of health; lieutenant and assistant surgeon, Fifth Infantry, M. V. M., in 1901, and major and surgeon in 1905; died at his home, recently, from influenza.

Earle William Gilroy ✠ **Lieut., M. C., U. S. Army,** Minneapolis; Rush Medical College, 1916; aged 25; who entered the service, Dec. 5, 1917, and at the time of his discharge, Dec. 8, 1918, was head of the department of pathology at the base hospital, Camp Wheeler, Macon, Ga.; died in Minneapolis, December 30, from pneumonia following influenza.

Melville C. Martin, Atlanta, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1882; aged 70; a Confederate veteran and commander of the North Georgia Brigade, U. C. V., for eighteen years chief surgeon of the Piedmont Air Line Railway, and for thirty years city physician; died at his home, December 19, from bronchial pneumonia.

Alpheus Alonzo Bondurant ✠ Cairo, Ill.; Bellevue Hospital Medical College, 1875; aged 68; for many years recording and corresponding secretary of the Southeast Missouri Medical Association; died at his home, December 7, from the effects of a gunshot wound, self-inflicted, it is believed, with suicidal intent, while despondent on account of ill health.

Cornelius Williams, St. Paul; College of Physicians and Surgeons in the City of New York, 1874; aged 70; a member of the Minnesota State Medical Association, and once president of the Ramsey County Medical Society; a specialist in diseases of the eye, ear, nose and throat; died in St. Luke's Hospital, St. Paul, December 30.

Alfred James Weed, Granby, Conn.; College of Physicians and Surgeons in the City of New York, 1878; aged 61; who was struck by an automobile while crossing a street in Granby, December 24, sustaining injuries to his right leg; died in the Hartford (Conn.) Hospital, December 29, from bronchial pneumonia.

Moss McB. Bannerman, Shreveport, La.; University of Virginia, Charlottesville, 1885; aged 53; once president of the DeSoto Parish Medical Society; who was injured in a collision between a trolley car and his automobile, December 30, died at the Highland Sanitarium, Shreveport, December 31.

Mandaville W. McClain, Vera Cruz, Ind.; Curtis Physio-Medical Institute, Marion, Ind., 1895; American Eclectic Medical College, Cincinnati, 1896; aged 47; a member of the Indiana States Medical Association; died at the home of his sister-in-law in Bluffton, December 28, from heart disease.

Elmer D. Olmsted ✠ Spokane, Wash.; Homeopathic Medical College of Missouri, St. Louis, 1878; aged 69; for three terms a member of the State Board of Medical Examiners; formerly mayor of Spokane; first president of the Chamber of Commerce of Spokane; died, about December 29.

Lewis U. Iverson, Christine, N. D.; University of Minnesota, Minneapolis, 1897; aged 54; died at his home, about December 26, from the effects of a gunshot wound of the head believed to have been self-inflicted, with suicidal intent, while suffering from a nervous breakdown.

Thomas Byram Vice, Flemingsburg, Ky.; Medical College of Ohio, Cincinnati, 1890; aged 51; a member of the Kentucky State Medical Association; president of the Fleming County Medical Society; died at his home, November 7, from bronchial pneumonia following influenza.

Carl Dinsmore Gray ✠ **Lieut., M. C., U. S. Army,** Portland, Me.; Bowdoin Medical School, Brunswick and Portland, 1915; aged 32; who had received an honorable discharge from the Army, died while en route to his home in Portland, December 19, from complications following influenza.

Herman William Schlappi ✠ Fulton, N. Y.; University of Buffalo, N. Y., 1904; aged 40; who was honorably discharged as lieutenant, M. C., U. S. Army, April 30; a Fellow of the New York Academy of Medicine; died at his home, November 21, from carcinoma of the stomach.

Sidney Charles Vermilyea ✠ **Lieut., M. C., U. S. Army,** Poughkeepsie, N. Y.; University of Syracuse, N. Y., 1912; aged 31; assistant physician in the Hudson River State Hospital; who went overseas several months ago, is reported to have died in the service.

Clarence William Anderson, Rochester, Minn.; University of Louisville, Ky., 1911; aged 32; a member of the Minnesota State Medical Association; a member of the staff of the Mayo Clinic, Rochester; died in Red Wing, Minn., December 28, from heart disease.

Samuel Victor Rosenkranz ✠ **Lieut., M. C., U. S. Army,** Los Angeles; College of Physicians and Surgeons, Los Angeles, 1915; aged 28; died in the United States Marine Hospital, San Francisco, October 20, from pneumonia following influenza.

Frank Trimper Allen, Neodesha, Kan.; Northwestern University Medical School, Chicago, 1873; aged 69; a member of the Kansas Medical Society; division surgeon of the St. Louis and San Francisco Railroad; died at his home, January 2.

Thomas Joseph Courtney ✠ **Asst. Surg., Lieut. (j. g.), U. S. Navy,** Worcester, Mass.; Tufts College Medical School, Boston, 1912; aged 32; who entered the Navy, Nov. 17, 1917, and was on duty at Norfolk, Va.; died at Norfolk, December 27.

William Sutherland Connery ✠ Saginaw, Mich.; University of Michigan, Ann Arbor, 1889; aged 50; who served in the Navy during the war with Spain, and was for many years coroner of Saginaw County; died at his home, December 23.

Edward Merrick Semans ✠ Delaware, Ohio; Miami Medical College, Cincinnati, 1890; aged 54; major and surgeon during the war with Spain; died at the home of his wife's mother in Portsmouth, Ohio, December 31, from heart disease.

Gerhard Frederick Hartwig ✠ **Lieut., M. C., U. S. Army,** Young America, Minn.; University of Illinois, Chicago, 1915; aged 29; on duty with the Three Hundred and Fifty-First Infantry, A. E. F., in France; was killed in action, October 31.

John Darby Gaskins ✠ Jacksonville, Fla.; College of Physicians and Surgeons in the City of New York, 1905; aged 38; obstetrician to Riverside Hospital, Jacksonville; died at his home, October 10, from double pneumonia following influenza.

Rufus Allen Thompson, Norwich, N. Y.; New York University, New York City, 1879; aged 65; once secretary and president of the Chanango County Medical Society; died in his office in Norwich, December 28, from heart disease.

Theodore LeGrande Burnett ✠ **Capt., M. C., U. S. Army,** Louisville, Ky.; University of Louisville, 1913; aged 28; on duty at Camp Shelby, Hattiesburg, Miss.; died in that camp, November 5, from pneumonia following influenza.

Carl Ernst Hermann Graeb, Denver; College of Physicians and Surgeons in the City of New York, 1894; aged 55; formerly city chemist of Denver; whose license was revoked in 1907; died at his home, December 27, from dropsy.

Theron Nichols, South Pasadena, Calif.; Northwestern University Medical School, Chicago, 1867; aged 77; formerly of Milwaukee; a veteran of the Civil War; died at his home, December 29, from asphyxiation by illuminating gas.

William W. Hall, Toledo, Ohio; Northwestern Ohio College, Toledo, Ohio, 1885; aged 56; who was assaulted by a saloonkeeper, December 12; died in St. Vincent's Hospital, Toledo, December 19, from cerebral hemorrhage.

Royden Benedict Yoder ✠ **Lieut., M. C., U. S. Army,** Northwood, Iowa; Hahnemann Medical College, Chicago, 1909; aged 33; died at Camp Custer, Battle Creek, Mich., December 9, from pneumonia following influenza.

John Herbert Bunn, Springfield, Ohio; Starling Medical College, Columbus, Ohio, 1902; aged 44; a member of the Ohio State Medical Association; died at his home, December 13, from pneumonia following influenza.

John Jennings Cleckley, Bamburg, S. C.; University of Maryland, Baltimore, 1904; aged 39; a member of the South Carolina Medical Association; died at his home, October 24, from pneumonia following influenza.

Edwin Emery Jones ✠ Colebrook, N. H.; Dartmouth Medical School, Hanover, N. H., 1894; aged 48; was killed by the overturning of his automobile on an embankment near North Stratford, N. H., December 29.

Joseph Louis Swarts ✠ **Lieut., M. C., U. S. Army,** St. Louis; St. Louis University, St. Louis, 1911; aged 33; a specialist in pediatrics; on duty at Fort Oglethorpe, Ga.; died at that post, December 24, from pneumonia.

George W. Smith, Minneapolis, Kan.; American Eclectic Medical College of Ohio, Cincinnati, 1879; aged 78; a veteran of the Civil War; died at his home, December 6.

Henry Kip ✠ Paterson, N. J.; College of Physicians and Surgeons in the City of New York, 1877; aged 66; died at his home, December 23, from pneumonia.

Guthrie Olaf Burrell ✠ **Lieut, M. C., U. S. Army,** Bucyrus, Ohio; Ohio State University, Columbus, 1916; aged 26; who went overseas in April, 1918; was killed in action, September 28, in France, death being due to a shrapnel wound of the head.

John Colavin McCabe, Hamilton, Ont.; Trinity Medical College, Toronto, Ont., 1886; aged 63; a member of the College of Physicians and Surgeons, Toronto; died at his home, November 18, from pneumonia.

John H. S. Reiley, Jr., Sardinia, Ind.; Medical College of Indiana, Indianapolis, 1904; aged 40; a member of the Indiana State Medical Society; died at his home, December 20, from pneumonia following influenza.

Willoughby K. Kistler, Leighton, Pa.; Bellevue Hospital Medical College, 1870; aged 72; a member of the Medical Society of the State of Pennsylvania; died at his home, December 27, from pneumonia.

George Anderson Cubbison, Erie, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1897; aged 55; a specialist in ophthalmology; died at his home, December 21, from pneumonia following influenza.

Edward Humphreys, Philadelphia, Hahnemann Medical College, Philadelphia, 1881; aged 61; a member of the Medical Society of the State of Pennsylvania; died at his home, December 25, from nephritis.

Lloyd Reuben Boutwell ✠ **Lieut., M. C., U. S. Army,** Kansas City, Mo.; Washington University, St. Louis, 1916; aged 29; is reported to have died in France, November 14, from wounds received in action.

Eugene F. Taylor, Greensburg, Ky.; Kentucky School of Medicine, Louisville, 1892; aged 49; a member of the Kentucky State Medical Association; died at his home, October 26, from pneumonia.

Allen R. Ransom, Denver (license, Illinois, 1878; Colorado, 1892); aged 61; whose license was revoked in April, 1918; was found dead in his office in Denver, December 17, from heart disease.

Hugh Dyosephus Wood ✠ Angola, Ind.; Bellevue Hospital Medical College, 1867; aged 83; a practitioner of Steuben County, Ind., for more than fifty years; died at his home, December 18.

William C. Fowler, Mount Sterling, Ill.; Missouri Medical College, St. Louis, 1887; aged 57; at one time a member of the Illinois State Medical Society; died at his home, December 18.

John Randolph Sloan ✠ Stanley, Kan.; Kansas City (Mo.) Medical College, 1891; aged 67; died in St. Joseph's Hospital, Kansas City, Mo., December 6, from bronchopneumonia.

John William Beebout, Dexter City, Ohio; Starling Medical College, Columbus, Ohio, 1896; aged 47; a member of the Ohio State Medical Society; died, December 25, from nephritis.

James Marsh Jackson ✠ Boston and Beverly Farms, Mass.; Harvard Medical School, 1891; aged 54; a member of the New England Pediatric Society; died at his home, December 27.

Elizabeth H. Trout, Chicago; Northwestern University Woman's Medical School, Chicago, 1884; aged 70; died at her home in Austin, Chicago, November 23, from pernicious anemia.

James Lawrence Schrote ✠ Vanlue, Ohio; Eclectic Medical Institute, Cincinnati, 1886; aged 58; died at his home, October 22, from carcinoma of the liver.

George Rankin Hyde, Prairieville, Mich.; Bellevue Hospital Medical College, 1885; aged 65; elected probate judge in 1916; died at his home, December 14.

John E. Bahrenburg, Glendale, Calif.; Missouri Medical College, St. Louis, 1877; aged 61; died at the home of his son in Oil Center, Calif., December 23.

Oswald F. Rudolph, Corning, Calif.; Cincinnati College of Medicine and Surgery, 1885; aged 62; a member of the Medical Society of the State of California; died at his home, December 13, from heart disease.

John Stephen Herlihy, San Diego, Calif.; University of Buffalo, N. Y., 1909; aged 35; died at his home, December 21, after an operation for appendicitis.

John M. Wilkinson, Evart, Mich.; Philadelphia University of Medicine and Surgery, 1869; aged 73; died at his home, December 15, from influenza.

John Cooper, Blackfoot, Idaho; Eclectic Medical Institute, Cincinnati, 1870; aged 77; died at his home, December 16, from a nervous breakdown.

Isaac N. Myers ✠ Maples, Ind.; Medical College of Fort Wayne, Ind., 1877; aged 64; died at his home, October 10, from cerebral hemorrhage.

Balthazar J. Meyer, Chicago; University of Christiania, Norway, 1877; aged 68; died at his home, December 30, from tuberculosis.

Jules LePanet Fremont, Quebec, Que.; Laval University, Quebec, 1909; aged 33; died at his home, October 12, from influenza.

George Edward Murray, Hagerstown, Md.; Hahnemann Medical College, Philadelphia, 1882; died, recently, at his home.

Darius G. Pickett, Fredonia, N. Y.; University of Buffalo, N. Y., 1874; aged 77; died at his home, December 27.

Died in the Service
IN FRANCE
CAPT. W. A. FAIR, M. C.,
U. S. ARMY, 1883-1918
(*See The Journal, last week, p. 134*)

Died in the Service
IN FRANCE
LIEUT. REESE DAVIS, M. C.,
U. S. ARMY, 1883-1918
(*See The Journal, Jan. 4, p. 58*)

Died in the Service
IN FRANCE
LIEUT. G. O. BURRELL, M. C.,
U. S. ARMY, 1892-1918

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

"PLURIGLANDULAR" MIXTURES

Caps. Adreno-Spermin Comp., Caps. Antero-Pituitary Comp., Caps. Placento-Mammary Comp., Caps. Thyro-Ovarian Comp., Caps. Hepato-Splenic Comp., Caps. Pancreas Comp., and Caps. Thyroid Comp., Not Admitted to N. N. R.

After considering the evidence for the several "pluriglandular" mixtures described below, the Council declared them inadmissible to New and Nonofficial Remedies. The Council's action was communicated to the manufacturer, Henry R. Harrower, in accordance with the usual procedure. After giving due consideration to the manufacturer's reply the Council authorized publication of the report which appears below.

W. A. PUCKNER, Secretary.

With the offer "to supply you with as much literature as may be necessary and as little of the actual remedies as may be desired" if "the prospects for the inclusion of these formulas in N. N. R. are good," Henry R. Harrower sent the Council a booklet descriptive of his preparations and labels for the following mixtures:

Caps. Adreno-Spermin Comp., each said to contain "Adrenal Gland (total) gr. ¼, Thyroid Gland (U. S. P.) gr. 1/12, Spermin Extr. (from Gonads), Brain and Spinal Cord aa gr. 1, Calc. Glycerophosphate q. s. ad gr. 5."

Caps. Antero-Pituitary Comp., each said to contain "Anterior Pituitary Body gr. 2, Thymus Gland gr. 1, Thyroid Gland (U. S. P.) gr. 1/12, Calcium-phosphorus Comp. q. s. ad gr. 5."

Caps. Placento-Mammary Co., each said to contain "Desiccated Placenta gr. 2, Mammary Substance gr. 1½, Pituitary Body (total) gr. ⅓, Calcium-phosphorus Comp. q. s. ad gr. 5."

Caps. Thyro-Ovarian Comp., each said to contain "Desic. Corpora Lutea Ovarian Substance gr. 2½, Thyroid Gland (U. S. P.) gr. 1/12, Pituitary Gland (total) gr. ⅛, Calcium-phosphorus Comp. q. s. ad gr. 5."

Caps. Hepato-Splenic Comp., each said to contain "Liver Parenchyma, Spleen Substance aa gr. 2, Powd. Bile Salts gr. ½, Adreno-Spermin Co. (No. 1) gr. 1."

Caps. Pancreas Comp., each said to contain "Adrenal Gland, Pituitary Gland (total) aa gr. ½, Ovarian Substance gr. 1, Pancreas Substance q. s. ad gr. 5."

Caps. Thyroid Comp., each said to contain "Desic. Thyroid Gland (U. S. P.) gr. ⅓, Calcium-phosphorus Comp. q. s. ad gr. 5."

The Council declared these preparations inadmissible to New and Nonofficial Remedies, for reasons which follow:

1. Each of the mixtures contains one ingredient or more, which is neither recognized in the U. S. Pharmacopeia nor admitted to New and Nonofficial Remedies, namely: "Spermin Extract," "Brain," "Spinal Cord," "Desiccated Placenta," "Liver Parenchyma," "Spleen Substance," "Pancreas Substance" and "Calcium Phosphorus Comp. (Each 100 gm. represents Magnes. Phos. 1; Calc. glycerophos. 4; Potas. bicarb. 15; Sod. bicarb. 22 and Sod. chlor. q. s.)." For obvious reasons the Council does not accept a mixture containing an indefinite ingredient and hence it would be necessary as a preliminary for the consideration of any one of the mixtures that their unofficial ingredients be made eligible for New and Nonofficial Remedies by the submission of evidence that such ingredient is of uniform composition and that it is therapeutically valuable when given by mouth. There is no evidence that many of these organs have any value whatever when administered by the mouth or in any other way.

2. In the light of our knowledge the administration of gland mixtures in the host of conditions enumerated in the advertising circular is irrational and on a par with the use of the shotgun mixtures once in vogue.

Be it a pharmaceutical mixture, a "mixed" vaccine, or a "pluriglandular" product, the combination of two medicinal ingredients in a mixture must be considered contrary to rational therapy unless a good reason exists for such combination. Such mixtures are held in conflict with Rule 10 unless the manufacturer presents acceptable evidence for the value of his combination. A physician may prescribe any mixture which he considers indicated in a given case, but the marketing of mixtures of drugs in fixed proportions is in most instances irrational and a detriment to sound therapy.

Correspondence

"THE TREATMENT OF AMEBIC DYSENTERY WITH IPECAC BY RECTUM"

To the Editor:—In THE JOURNAL, Sept. 28, 1918, p. 1049, Dr. George B. Lawson gives the histories of two cases of amebic dysentery successfully treated by rectal injection of an unfiltered infusion of ipecac. He refers to Drs. Brem and Zeiler as being the first to administer the drug by the rectum and through the opened appendix. He also firmly believes in the amebicidic action of ipecac.

In an article in the *Grèce médicale* (**18**:6, 1916; abstr. J. A. M. A. **67**:474 [Aug. 5] 1916) I described how I was induced to administer ipecac by the rectal route years before the introduction of emetin hydrochlorid by Rogers, because of the intolerance of the stomach to ipecac administered according to the Brazilian method. I used a filtered infusion of lesser strength and volume than Lawson's by the rectal drip method, so as to have it absorbed. The symptoms of poisoning, often severe, proved that absorption was complete.

I did not aim at a local action of the drug on the ameba. As is known, that parasite in its vegetative phase does not lie free on the mucosa of the intestine, but is deeply embedded in its wall. Were this not true, then any other amebicide, especially silver nitrate, would effect a cure in amebic dysentery. No doubt emetin is a poison specially to amebas, as santonin is a poison for ascarides and as other agents are for other parasites. But even in the latter cases one must ask whether the action of the drug on the parasite is the result of contact, or does it follow after resecretion by the intestine of the previously absorbed germicidal substance? At all events, the action of emetin, injected subcutaneously, on amebas in the viscera, is not a direct one; the emetin reaches them diluted in the fluids of the body in a proportion of about 1:1,000,000; and it can be effected only by parasitotropy, which, by the rapidity of the circulation, brings the germicide in contact with the parasite in a short space of time.

This affinity shown by emetin for amebas is undoubtedly due to certain leukocytes. The action of pharmaceutic substances, when not immediately poisonous by coagulation of albumin or disintegration of cell structure, is a mediate one. They are subject to the general laws of nutrition—absorption and elimination. Their active course through the body is possible only by the intercession of the colloids, and the vast range of electric, organotropic energy is undoubtedly due to antigenic stimulation of cells. All function is based on fluctuations of the chemism of protoplasms and the physicism of solutions, and it is also by changes in their equilibrium that disease and recovery ensue.

As to the proper way for calling forth those changes, the shortest is not always the best. As we know, digitalis, specially directed to the organs of circulation, is less potent when directly introduced into the blood stream than when injected subcutaneously. Emetin seemed to me to belong to that class of substances, apparently offensive to the hematopoietic system and rejected by it in the fluids and tissues, being ultimately absorbed by degrees.

On the other hand, the various modes of administration of drugs are not equally adapted to the various remedial agents, even for the same drug in different form. I found that while the stomach is less tolerant to ipecac than to emetin, the reverse is true of the rectal route.

I. CECIKAS, M.D., Athens, Greece.

"THE TREATMENT OF HYSTERIA"

To the Editor:—There is so much that is good in Capt. J. M. Wolfsohn's contribution concerning the treatment of hysteria (The Journal, Dec. 21, 1918, p. 2057) that it is regrettable that he has added statements which negative a great deal of the positive part of his paper. His statement that "very little has ever been contributed to the treatment but volumes on the classification of hysterical disabilities" sounds peculiar when one remembers the volumes that have been written concerning hypnotism, reeducation and psychanalysis in the treatment of hysteria. He is modest enough at the beginning to say that the symptom is merely the outward sign, and that we wrongly say we have cured hysteria when we merely cure the hysterical symptom. Yet a little later he states that he cures more than 90 per cent. of the cases within the first twenty-four hours. The old methods of reeducation, combined with the use of mechanical adjuvants, he speaks of with kindly tolerance. He states that he cures in from one-half to one hour the same patients who had electrical treatment for six months by these old methods. Arousing our interest in this way, it comes as a disappointment when we later read that his methods consist also in the use of these mechanical measures coupled with peremptory commands. To quote from one of his cases: "He was finally treated with a mild faradic current and cured after three hours of treatment." To make matters worse, Captain Wolfsohn in his rules of treatment says that every case must be studied fully, and especially psychologically, before treatment is begun, and that this can even take the form of psychanalysis. How inconsistent this sounds in connection with his remarks in the earlier part of his paper that "he cures and completely cures more than 90 per cent. in twenty-four hours." If Captain Wolfsohn can make a complete psychologic study of every hysterical patient in one day, he is doing more than has heretofore been thought possible. However, I am sure he does not mean this but that he has allowed his enthusiasm to overrun his form of expression. Exaggeration and overvaluation of one's efforts is a hysterical trait, one of those often untouched and untreated manifestations of the hysterical psyche which the Captain speaks about in the earlier part of his paper. The importance of suggestion and the stronger influence that suggestion furnishes under military discipline perhaps explain the remarkable proportion of cure of symptoms he has effected. One gathers from his paper that he is a disciple of Babinski and a believer in the Déjerine isolation treatment but since "very little has ever been contributed to the treatment" he ignores those sources upon whose methods his own are based. In military circles one can do more than in civil life. "When the patient resists the cure," the Captain says, "this must be broken down by strong persuasion or by faradism." In civil practice, when the patient resists a cure the physician must desist because, as a rule, the patient goes to some other physician. This negatives also some short roads to a successful treatment which the Captain offers, such, for instance, as: "Do not discontinue the treatment until the cure is accomplished." And we feel that Rule 25, which says that "the secret of psychotherapy is a mental combat between the physician and the patient," is, to say the least, a rather unscientific and certainly unpsychologic point of view.

Edward E. Mayer, M.D., Pittsburgh.

To the Editor:—I have read the article on "The Treatment of Hysteria," by Capt. Julian M. Wolfsohn, with the hope of getting some new and really advanced ideas on the treatment of hysterical cases known on the firing line as shell shock cases. Many of these cases have been treated here in American base hospitals, with the exception that the injuries causing the condition were not received on the firing line; but these cases demonstrated all the points of interest that Captain Wolfsohn set forth in his interesting paper. In his final analysis, however, in laying down the cardinal principles of treatment, he fails, in my opinion, to state at least two, if not three, very important factors:

First, it would seem that at least many of these patients sustained some physical injury in combination with the hysteria, and that in all the cases he reports there was not one with a purely psychoneurotic disturbance alone. It has been demonstrated beyond a doubt that the patient who originally received a physical injury followed by some form of psychoneurotic symptoms is more easily cured: there is a physical fact from which one may convince the patient that he has recovered; and now that he is physically normal, he must be nervously normal as well.

Second, in the cases reported, all the patients were ill from a few weeks to many months. During that time, while waiting for the physical disturbance to clear up, the patient has been receiving subconscious mental treatment that has not been stimulated from the standpoint of intensive mental treatment by reeducation, which is a real fundamental principle in the treatment of all psychasthenic or psychoneurotic cases. In other words, the patient has undergone a real physical treatment with nervous and mental rest, and when the psychologic time arrives, he is cured almost instantly. This is beautifully illustrated by Wolfsohn's statement that some patients were cured in a few minutes, others in several or many hours, and others after days of anxious observation, waiting for that psychologic moment to arrive. The mental attitude of the patient has everything to do with this so-called spontaneous cure.

I simply make this criticism because the ordinary practitioner will not take into consideration the fact that hysteria without an actual physical cause is not as a rule cured in this way, and as easily as those cases in which some physical violence has been demonstrated or sustained. I could add a number of almost similar results, but it would be a repetition of what has been set forth in this interesting and valuable paper.

These two points, then, should be added to the twenty-seven general rules laid down: First, that the physical condition of the patient must be perfect ere treatment is begun for spontaneous cure, and second, that the long hospital treatment makes it possible to distinguish between a hysterical case with actual physical trauma and a case of purely nervous trauma.

Henry L. Stick, M.D., Camp Greene, N. C.
Captain, M. C., U. S. Army; Camp Psychiatrist.

ACTION OF DIGITALIS AND ATROPIN, WITH ESPECIAL REFERENCE TO THE HEART

To the Editor:—Digitalis affects the heart mainly in two ways: 1. It stimulates the pneumogastric center in the medulla, the resultant inhibition lessening the number of beats of the heart by prolonging the pause in diastole. Relaxation of fibers is increased; added rest is secured. Inhibition of some impulses from auricle to ventricle occurs —hence its value in auricular fibrillation. 2. It affects the heart muscle directly, increasing the strength of the ventricular contractions.

Atropin, in sufficient dose, paralyzes the inhibitory terminations of the pneumogastric in the heart, and stimulation of this nerve therefore causes no change in the pulse after its administration. Drugs have no effect in stimulating the pneumogastric after atropin has been given in sufficient dose to paralyze the inhibitory terminations. What is the sufficient dose? Cushny says 1 mg. (about $\frac{1}{65}$ grain), and that the administration of sufficient atropin to paralyze the pneumogastric involves unpleasant dryness of the throat and difficulty in swallowing. The usual therapeutic dose of from $\frac{1}{150}$ to $\frac{1}{100}$ grain would apparently be insufficient to cause the paralysis. There is some uncertainty about this, however, as the susceptibility of individuals varies greatly.

If we grant, however, that the therapeutic dose of atropin has this effect in causing the paralysis of the inhibitory apparatus of the pneumogastric, are we justified in using it when we are using digitalis? Before answering this question we must consider what we expect or hope to accomplish with atropin. I am thinking of its indications in the extensive and progressive type of bronchopneumonia, lately so common. There is an impression among many clinicians that these patients are often relieved of cyanosis after using atropin. The cyanosis may be due to a moderate narrowing of the bronchioles already filled with mucous secretion, as

asserted by a recent writer. According to Auer in the *American Journal of Physiology*, atropin prevents death in guinea-pigs subjected to anaphylactic shock by preventing the stenosis of the bronchioles. In beginning pulmonary edema it is commonly believed to be of value and is said to have an action on the permeability of the capillaries of the lungs, stopping the outward flow of fluid from the blood. These claims are made for it by several who have had large series of cases during the recent epidemic, including Keeton and Cushman, and Ridge. If, in the doses commonly given, it affects the inhibitory mechanism of the heart, we still have the effect of digitalis on the heart muscle, which effect is not influenced by atropin.

The two drugs are commonly used without paying much attention to these considerations; but there seems to be sufficient reason for keeping them in mind more than is customary. It is quite possible that small doses of atropin may be used in persons not especially susceptible to its effects, without seriously interfering with digitalis therapy; at least that is my conclusion from the foregoing.

WILLIAM E. MCCOLLOM, M.D., Brooklyn.
Assistant Visiting Physician, St. Mary's Hospital.

"THE EFFECT OF 'GROUND GLASS' ON THE GASTRO-INTESTINAL TRACT OF DOGS"

To the Editor:—The article in THE JOURNAL, Dec. 28, 1918, p. 2127, on "The Effect of 'Ground Glass' on the Gastro-Intestinal Tract of Dogs," reminds me of a peculiar case in my practice: About thirty-five years ago a minister brought to me a diaper recently removed from an infant about 30 months old. A small quantity of fecal matter on the cloth showed a number of small pieces of broken glass mixed with it. The child had found the glass on the floor and, as usual, put it into its mouth, and finally swallowed it. There was no blood on the diaper, and, as far as could be determined, no untoward effects resulted.

G. W. H. KEMPER, M.D., Muncie, Ind.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

INSTANCES OF LOW TEMPERATURE

To the Editor:—The temperature recorded in the following history seems to be about the lowest of which I can obtain any record. Will you tell me what is the lowest authentic temperature of which there is any record? A boy, 8 years old, with a severe pharyngeal diphtheria of eighteen days' duration, was admitted to the Rochester Municipal Hospital. He had received no antitoxin. The admission temperature was 99 F. In the next three days the temperature and pulse declined steadily, although not equally. Seven hours before death the rectal temperature was 91.8 F. Several thermometers were used and all agreed. Fifteen minutes before death the temperature rose to 94.4 F.

P. A. B., Rochester, N. Y.

ANSWER.—The lowest temperature on record, so far as we can discover, is that observed by J. J. Reincke (*Deutsch. Arch. f. klin. Med.* **16**:12, 1875) in a man who had spent part of the night outdoors, lying in a drunken stupor, exposed to a temperature of 32 F. At 8 a. m. the man's temperature by rectum was 75.2 F., and not until 1 o'clock in the afternoon of the following day did it return to normal. The man lived. Reincke also records the case of a man who jumped overboard from a transport, striking his head on a rock. He was picked up apparently dead, but vigorous attempts at artificial respiration proved successful. His rectal temperature was 91.7 F. Magnan (*Virchows Arch. f. path. Anat.* **53**:27, 1871) records the case of a drunken man whose rectal temperature was 79.8 F. Musser (General Diagnosis, 1900, p. 206) refers to a case of intermittent fever, with jaundice, in which the lowest recorded temperature was 91 F. He does not state whether the patient survived. It will be noted that these references are far from being recent. Perhaps some of the readers of THE JOURNAL may know of more recent references.

BENEDICT TEST—HILUM OF LUNG—KRÖNIG'S ISTHMUS

To the Editor:—1. In an article on diabetes which I read in THE JOURNAL, mention is made of the Benedict test. 2. and 3. In another article, reference is made to the lung hilum and to the isthmus of Krönig. As I have been unable to find in my books the meaning of these terms, I should appreciate your explaining them to me.

LUIS LAZO AMIAGA, M.D., San Salvador.

ANSWER.—1. The mixture for the Benedict test for sugar in the urine is composed of:

	Gm.or C.c.
Copper sulphate (pure crystallized)	17.3
Sodium or potassium citrate	173.0
Sodium carbonate (crystallized)	200.0
Distilled water .....to make	1,000.0

The citrate and carbonate are dissolved together (with the aid of heat) in about 700 c.c. of water. The mixture is then poured (through a filter if necessary) into a larger beaker or casserole. The copper sulphate (which should be dissolved separately in about 100 c.c. of water) is then poured slowly into the first solution, with constant stirring. The mixture is then cooled and diluted to 1 liter. For the detection of glucose in the urine, about 5 c.c. of the reagent is placed in a test tube and from 8 to 10 drops (not more) of the urine to be examined are added. The mixture is then heated to vigorous boiling, kept at this temperature for one or two minutes, and allowed to cool spontaneously. In the presence of glucose the entire body of the solution will be filled with a precipitate which may be red, yellow or greenish in tint. If the quantity of glucose is low (under 0.3 per cent.), the precipitate forms only on cooling. If no sugar is present, the solution either remains perfectly clear or shows a faint turbidity which is blue and consists of precipitated urates. The test is said to be ten times as sensitive to sugar in urine as is Fehling's or Haines' solution.

2. The hilum of the lung or hilum pulmonum is the depression on the mediastinal surface of the lung where the bronchus, blood vessels and nerves enter, and the reference in the article is to this region.

3. Krönig's isthmus refers to the apexes of the lungs behind and above the clavicles or in the area bounded by the clavicle and the borders of the trapezia, to the auscultation and percussion of which Krönig has called attention in the diagnosis of tuberculosis of the lungs.

DR. EDWARDS' OLIVE TABLETS

To the Editor:—Please advise me as to the composition of Dr. Edwards' Olive Tablets in the next copy of THE JOURNAL, but do not mention my name.

M.D., Chicago.

ANSWER.—These are purgative pills, and the claims under which they have been sold are either directly or inferentially misleading. The public has been given the impression that the pills owe their alleged virtue to the presence of olive oil. The American Medical Association's Chemical Laboratory made some cursory tests of the pills in 1913, and reported that they were essentially an aloes pill. These findings were substantiated by a more complete analysis made by the Connecticut Agricultural Experiment Station, which, in its report for 1914, declared that the pills contained dextrose, starch, aloes and ginger. A brief article on this product appears in the pamphlet, "Miscellaneous Nostrums," price 15 cents.

GERMICIDE IN THERMOMETER CASE

To the Editor:—There is a thermometer case that holds a small quantity of fluid to disinfect the thermometer while in the case. The use of alcohol in the case is recommended as the disinfecting fluid. Is alcohol an efficient disinfectant for this purpose? If not, what do you recommend?

C. R. PICKERING, B.S., M.D., Muscoda, Wis.

ANSWER.—Various disinfectants have been recommended for use in the thermometer carrying case, the chief among them being formaldehyd and alcohol solutions. Formaldehyd is a slowly acting germicide and is irritant to some persons. Alcohol is probably as effective for the purpose as anything. When alcohol is employed, care should be taken that its strength be maintained between 50 and 80 per cent., otherwise its germicidal value is lessened; also the thermometer should be cleaned of all secretions before it is returned to the "aseptic" case. To be disinfected, the thermometer should remain *in* the alcohol solution at least thirty minutes, although a longer time is preferable. The case should be recharged frequently.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALASKA: Juneau, March 4. Sec., Dr. L. P. Dawes, Juneau.
ILLINOIS: Chicago, March 3-5. Mr. F. C. Dodds, Supt. of Registration, Springfield.
KANSAS: Topeka, Feb. 11. Sec., Dr. H. A. Dykes, Lebanon.
MISSOURI: St. Louis, Jan. 28-30. Sec., Dr. G. H. Jones, State House, Jefferson City.
NEBRASKA: Lincoln, Feb. 12. Sec., Dr. H. J. Lehnhoff, 514 First Natl. Bank Bldg., Lincoln.
NEW YORK: Jan. 28-31. Albany, Buffalo, New York City and Syracuse. Mr. Herbert J. Hamilton, Asst. Prof. Exams., New York Dept. of Education, Albany.
VERMONT: Burlington, Feb. 11. Sec., Dr. W. Scott Nay, Underhill.
WYOMING: Moorcroft, Feb. 12-14. Sec., Dr. H. E. McCollum, Laramie.

Arkansas November Examination

Dr. T. J. Stout, secretary of the Arkansas Board of Medical Examiners, reports the written examination held at Little Rock, Nov. 12-13, 1918. The examination covered 12 subjects and included 120 questions. An average of 75 per cent. was required to pass. Of the 4 candidates examined, 2 passed and 2 failed. Three candidates were granted reregistration certificates. The following colleges were represented:

College	Year Grad.	Total No. Licensed
PASSED		
College of Physicians and Surgeons, Little Rock	(1910)	1
Missouri Medical College	(1860)	1
FAILED		
Meharry Medical College	(1918)	1
University of Nashville	(1909)	1

Dr. Stout also reports that 8 candidates were licensed through reciprocity from May to November, 1918. The following colleges were represented:

College	Year Grad.	Reciprocity with
LICENSED THROUGH RECIPROCITY		
College of Physicians and Surgeons, Chicago	(1893)	Oklahoma
Tulane University	(1918)	Louisiana
Missouri Medical College	(1898)	Oklahoma
Long Island College Hospital	(1910)	N. Dakota
Jefferson Medical College	(1886) Texas; (1894)	S. Dakota
Memphis Hospital Medical College	(1907) (1911)	Mississippi

Illinois September Examination

Mr. F. C. Dodds, superintendent of registration, Department of Registration and Education, reports the practical and written examination held at Chicago, Sept. 24-27, 1918. The examination covered 10 subjects and included 100 questions. An average of 75 per cent. was required to pass. Of the 55 candidates examined, 33 passed and 22 failed. Fourteen candidates were licensed through reciprocity. The following colleges were represented:

College	Year Grad.	Total No. Licensed
PASSED		
Howard University	(1918)	1
Bennett College of Eclectic Medicine and Surgery	(1905)	1
Chicago College of Medicine and Surgery	(1917, 6) (1918, 7)	13
Chicago Hospital College of Medicine	(1917)	1
Hahnemann Med. Coll. and Hosp. of Chicago	(1918)	1
Jenner Medical College	(1917)	1
Loyola University	(1916)	2
Rush Medical College	(1917) (1918, 7)*	8
University of Illinois	(1918)	1
Washington University	(1918)	1
Meharry Medical College	(1904) (1917)	2
Wisconsin College of Physicians and Surgeons	(1901)	1
FAILED		
American College of Medicine and Surgery	(1905)	1
Bennett Medical College	(1910, 2) (1912) (1914)	4
Chicago College of Med. and Surgery	(1917, 4) (1918, 4)	8
Chicago Hospital College of Medicine	(1915)	2
Illinois Medical College	(1910)	1
Jenner Medical College	(1911)	1
Loyola University	(1916) (1917)	2
Reliance Medical College	(1911)	1
State University of Iowa Coll. of H. Med.	(1901)	1
Meharry Medical College	(1916)	1

College	Year Grad.	Reciprocity with
LICENSED THROUGH RECIPROCITY		
George Washington University	(1907)	U. S. Army
Bennett Medical College	(1912)	Nebraska
Illinois Medical College	(1910)	Missouri
Rush Medical College	(1916) Minnesota; (1917)	U. S. Navy
Indiana University	(1917)	Indiana
Medical College of Indiana	(1893) (1905)	Indiana
Southern Homeopathic Medical College	(1897)	Virginia
University of Michigan Medical School	(1908) (1916)	Michigan
National University of Arts and Sciences	(1914)	Missouri
St. Louis University	(1913)	Missouri
Hahnemann Med. Coll. and Hosp. of Philadelphia	(1896)	Ohio

*Three of these candidates received certificates for four years' work. The M.D. degree will be granted on completion of internship.

Book Notices

THE AMERICAN ENCYCLOPEDIA AND DICTIONARY OF OPHTHALMOLOGY. Edited by Lieut.-Col. Casey A. Wood, M. C., U. S. Army, M.D., C.M., Professor of Ophthalmology and Head of the Department, College of Medicine, University of Illinois. Assisted by a Large Staff of Collaborators. Volume XIII. Phonoscope to Protozoic Disease of the Lids. Cloth. Price, $10. Pp. 760, with illustrations. Chicago: Cleveland Press, 1918.

Notwithstanding the great war with its accompanying difficulties of publication, practically no delay has been occasioned in the appearance of the thirteenth volume of this encyclopedia. Physiologic optics is the outstanding topic of this volume, the article on which covers almost 500 pages: a large book in itself. Other important topics are the phorometer, the ocular relations of pituitary disease, ocular symptoms of poliomyelitis, ocular disturbances of pregnancy, and preparation for ophthalmic operations. Pliny the Elder, though not an ophthalmologist, was, like the editor of our present work, an encyclopedist, and his great and only surviving work, "Historia Naturalis," a compilation of contemporary Greco-Roman knowledge on a great variety of subjects, contains many references to the eye, its diseases and the remedies applied in their cure. From this material many pages of quotations appear in the present volume for the reason, as the editor says, that his observations on matters connected with the eye are of interest to the modern ophthalmologist—some of them for one reason and others for another. Bound up with the myth and superstition and curious practices of the ancients, they often shed curious sidelights on present terms and formulas and empiricisms that have not yet departed from medicine, even from the advanced branch that concerns the eye. As each additional volume appears, the magnitude of this work becomes more and more evident. Protozoic disease of the lids is the topic marking the limit of this, the thirteenth, volume. Judging from the volumes already issued, four, or probably five, more may be required, thus making an encyclopedia of eighteen volumes. It certainly promises to be a work that will be a credit to American medicine.

THE DISEASES OF INFANCY AND CHILDHOOD. Designed for the Use of Students and Practitioners of Medicine. By Henry Koplik, M.D., Attending Pediatrist to the Mount Sinai Hospital. Fourth edition. Cloth. Price, $6. Pp. 928, with 264 illustrations. Philadelphia: Lea & Febiger, 1918.

Rapid advances in pediatrics have necessitated new and extensive changes in Dr. Koplik's well known textbook. This is particularly notable in the section on infectious diseases and on acidosis in infancy, and in the statistical matter. The book contains excellent illustrations, many of them original plates taken directly from Dr. Koplik's practice. The most important subject in diseases of children is feeding. This book contains a discussion that is clear and apparently complete. The sections on treatment are especially practical, since recommendations for drug treatment are simple and rational.

A MANUAL OF PHYSIOLOGY WITH PRACTICAL EXERCISES. By G. N. Stewart, M.A., D.Sc., M.D., Professor of Experimental Medicine in Western Reserve University. Eighth edition. Cloth. Price, $5. Pp. 1245, with 496 illustrations. New York: William Wood & Co., 1918.

Professor Stewart points out in his preface that the war has had a withering influence on research in physiology. Nevertheless, considerable changes and additions have been made to his text, especially in the portions dealing with chemical phenomena of respiration, the functions of the endocrine organs, and metabolism. Some of the newer calorimetric work has also been adequately taken account

of. Some of the older and less valuable illustrations have been omitted and new ones added. In deference to the opinion of many teachers, a bibliography has been inserted as an appendix. The book continues to be one of the standard textbooks on physiology.

Medicolegal

Negligence in Treating Eyes of Child—Failure to Order Removal to Hospital

(Medlin v. Bloom (Mass.), 119 N. E. R. 773)

The Supreme Judicial Court of Massachusetts, which sustains exceptions for the plaintiff after a verdict was rendered for the defendant, says that this action, which was brought in the name of an infant, by his father, was one of tort, as it is termed, for the alleged negligence of the defendant, a physician, in the care of the plaintiff, by reason of which the latter became blind. The plaintiff was born, April 14, 1916. The defendant signed a birth certificate which stated that he personally attended the birth of the plaintiff, although he admitted he did not deliver the child, but attended him between five and six hours after he was born. He testified that when he was first called he put a solution of silver nitrate in the plaintiff's eyes; but this was denied by the plaintiff, who offered evidence to the contrary. That such treatment was proper, "and is a part of the technic of childbirth," was admitted by the defendant and others; and there was also evidence that the administering of the solution of silver nitrate at birth would make the liklihood of the development of the disease of ophthalmia, which caused the blindness, very much less. The defendant offered evidence that even if no solution of silver nitrate was administered at birth, it was shown that the disease was due to a secondary infection, as the symptoms did not develop until eight days afterward, and that the failure to give the treatment made no difference. The questions whether the defendant failed to administer the treatment or not, and whether, if it was not administered, the plaintiff's blindness was due to such omission as a proximate cause, were rightly submitted to the jury.

The presiding judge instructed the jury in substance that the failure of the defendant to report the case to the board of health as promptly as he should have done under the state statute was immaterial, and was not to be considered as evidence of negligence; but the supreme judicial court is of the opinion that this was error, and that the plaintiff was entitled to the ruling asked by him that if the jury found that the defendant violated the provisions of the statute that was evidence of negligence on his part. It could have been found that the defendant on the afternoon of April 25, 1916, knew that the plaintiff's eyes had become inflamed, swollen and red, and showed an unnatural discharge within two weeks after birth. In these circumstances, it was the defendant's duty, under the statute, immediately to give notice thereof in writing over his own signature to the board of health. A penalty is prescribed for violation of the statute. The evidence showed that the notice mailed by him was postmarked "12:30 a. m., April 27." The evident purpose of this statute is that the board of health may be informed without delay of the existence of a most serious disease with which very young children may be affected, so that immediate and scientific treatment may be received, and blindness prevented. On this record it could not properly have been ruled as a matter of law that the delay of the defendant in notifying the board of health of the plaintiff's condition was not evidence of negligence. It was for the jury to determine whether the defendant immediately gave the notice required by the statute. If he failed in this respect, such failure was evidence of negligence which could have been found to have resulted as a proximate cause of the plaintiff's blindness.

But while it might be that the plaintiff would have received better medical treatment if he had been removed to a hospital, yet the defendant's failure to order such removal did not, on the record in this case, of itself constitute evidence of negligence sufficient to justify a verdict for the plaintiff. While a physician may advise the removal of a patient to a hospital, in an ordinary case he has no authority to order such removal. Testimony relating to the plaintiff's home, and whether treatment there would have been proper or would have been more efficient or desirable in a hospital, was properly excluded.

Liability for Injuries to Convulsive Patient—Evidence

(Connor v. O'Donnell (Mass.), 119 N. E. R. 446)

The Supreme Judicial Court of Massachusetts had here two cases: one brought by Mrs. Connor to recover damages from the defendant, a physician, for alleged negligence in his treatment and care of her after she had given birth to a child; the other, brought by her husband to recover consequential damages. The court, always referring to Mrs. Connor as the plaintiff, says that she filed specifications of the unskilfulness and negligence of the defendant, alleged in her declaration in substance as follows: The first specification alleged that the defendant negligently directed that the plaintiff, while suffering from convulsions following childbirth, be restrained and held in bed by holding her by her wrists, whereby her shoulders became dislocated and fractured; the second specification alleged that after the plaintiff's shoulders had been fractured and dislocated, the defendant failed to discover her injuries and negligently prescribed treatment which caused her great pain and resulted in permanent disabilities. The plaintiff testified that she went to bed at about 2 a. m., and was unconscious during the birth of her child; that she did not regain consciousness for a period of from twenty-four to forty-eight hours, and immediately thereafter she felt severe pains in her shoulders, "causing her terrible agony to move her fingers or hands." The defendant testified that he went to the plaintiff's house at about 7:30 a. m., and found her suffering from violent convulsions; that she was unconscious; that he gave her injections of morphin to relieve her, and in order to restrain her he and the nurse held her by the wrists. There was also evidence that the defendant directed the plaintiff's husband so to hold her if she had further convulsions. The husband testified that during the evening of the same day she had thirteen convulsions, and that on those occasions he held her in bed by her wrists. There was evidence that her shoulders had never been injured before she became unconscious. It appeared from the undisputed evidence that, about two weeks after the child was born, one of her shoulders was discovered to be fractured and the other dislocated.

While there was evidence from which the jury could have found that her injuries might have been caused solely by the convulsions, still there was other evidence that such injuries were due to holding her wrists to restrain her and that she was so held by the defendant's direction. On this conflicting testimony it could not have been ruled that there was no evidence to support the allegations of the first specification. Then there was evidence that after she became conscious and while her shoulders were in the condition above described, the defendant directed that they be manipulated, that by reason of such treatment she was caused great pain, and that the defendant at that time had failed to discover the fracture and dislocation; also, that such treatment was unskilful and negligent. This evidence was sufficient to support the allegations of the second specification. It followed that requests for rulings that there was no evidence to support the specifications were rightly refused, and that a motion to direct a verdict for the defendant in each case was properly denied.

But exceptions to verdicts for the plaintiffs are sustained because a medical expert called as a witness by the plaintiff was allowed to express an opinion founded in part on "the evidence in the case," which was conflicting, he being asked whether, coming to the left shoulder, from his examination of the plate and Mrs. Connor and the evidence in the case, he had formed any opinion as to the cause of the present condition. It is settled that an expert witness cannot be asked or allowed to express an opinion founded in whole or in part on the evidence where it is conflicting.

Society Proceedings

COMING MEETINGS

Southern Minnesota Medical Association, Mankato, Jan. 20-21.

SOUTHERN SURGICAL ASSOCIATION

Thirty-First Annual Session, held at Baltimore, Dec. 17-19, 1918

The President, DR. ISAAC S. STONE, Washington, D. C., in the Chair

Suture of Ruptured Kidney, with Report of a Case

DR. S. L. LEDBETTER, JR., Birmingham, Ala.: Early exploration is indicated in subparietal injury to the kidney, and suturing the ruptured kidney when possible is preferable to either nephrectomy or gauze packing. Nephrectomy should be reserved for those cases in which operation has been delayed and when the kidney is hopelessly damaged. Packing with gauze, when possible, is to be avoided on account of the delayed convalescence, the danger of secondary hemorrhage, and the possibility of infection.

Prostatectomy: Preparatory and Postoperative Treatment

DR. BRANSFORD LEWIS, St. Louis: I have adopted the suprapubic method as the operation of choice because it gives the better results. It is free from a number of momentous objections that pertain to the perineal operation, such as ineffectual urinary control, sexual disability, and urethrorectal fistula. While a one-stage suprapubic prostatectomy may be carried out with confidence and safety in a patient of middle age and good general condition, there is no doubt about the distinct advantages presented by the same operation done in two stages in the decrepit patient of advanced years and weakened resisting powers. The opportunity presented by the two-stage operation of establishing a firm adhesion between bladder and abdominal walls is scarcely less valuable than that of establishing suprapubic drainage. Infection of the loose connective tissues surrounding the bladder, with extensive suppuration, is one of the most serious dangers attendant on suprapubic work. Once established, such suppuration is difficult of control, and the condition may rapidly become formidable. The ounce of prevention consists in attaching the bladder firmly and permanently to the abdominal wall around the opening in the bladder by means of chromicized catgut sutures.

Spinal anesthesia is commended as serviceable by some operators, but I regard it as the most dangerous of all methods of anesthesia. I know of no deaths so far reported from the use of caudal anesthesia, although there have been instances in which physiologic effects have been observed.

DISCUSSION

DR. JOHN R. WATHEN, Louisville: The main thing in prostatic surgery is proper drainage and the avoidance of infection. I disagree with the statement that the in-dwelling catheter should remain in the urethra a considerable time. My experience has been that the in-dwelling catheter is not tolerated by the majority of patients for a considerable time, and some patients can hardly stand it at all. The suprapubic operation under local anesthesia is the operation of choice.

DR. ROBERT T. MORRIS, New York: After the suprapubic operation I like to fold the ragged fragments into place pretty well and pack them there with neat folds of iodoform gauze, leaving the end of the gauze protruding from the suprapubic wound; and for drainage I use little packs of sphagnum moss, allow the patient to turn on one side or the other, or abdomen, if he likes, and I depend on the capillarity of the gauze and sphagnum moss.

DR. FRANCIS REDER, St. Louis: A mortality following prostatectomy rests with the loss of blood. It is the constant bleeding in these cases that causes fatalities, and in the after-treatment of cases of prostatectomy I recommend the use of the Hagner bag for the control of hemorrhage.

DR. JAMES E. THOMPSON, Galveston, Texas: One of the most important tests as to how patients behave after operative procedures is the estimation of the blood urea.

DR. GEORGE A. HENDON, Louisville, Ky.: In suprapubic prostatectomy I pack the cavity from which the prostate has been removed lightly with iodoform gauze or plain gauze, allowing the ends to protrude from the suprapubic incision; but before doing so I put an ordinary Nélaton catheter into the bladder. The first twenty-four hours a lot of clots may form, but by irrigation with 6 or 12 ounces of warm boric acid solution, the lumen of the catheter is kept open and no clot is formed. All drainage takes place through the catheter in the urethra, and is collected by a urinal between the patient's leg. On the third day I remove the gauze packing, and all the drainage takes place below through the natural way. I have not had any suppuration or hemorrhages to make me dissatisfied with this method of treatment.

Irritable Bladder of Women

DR. CHARLES A. L. REED, Cincinnati: (This paper will be published in full in THE JOURNAL.)

Gauze Sponge Expelled Spontaneously from the Urinary Bladder

DR. G. PAUL LAROQUE, Richmond, Va.: Five years ago a woman was operated on and was told that the appendix and left ovary were removed and the uterus suspended. No drainage was employed. She remained perfectly well for five years and was then seized suddenly with agonizing bladder tenesmus, spasmodic incontinence of urine, and an enormous quantity of foul-smelling pus. Roentgen examination for stone was negative; there were no clinical evidences on examination. Cystostomy was not attempted on account of the violence of pain and the inability to hold water in the bladder. The body temperature varied from normal to 101 F.; the pulse varied from normal to 100. Vaginal examination detected a small mass in the right fornix.

There were no menstrual symptoms. On two occasions the patient had retention of urine, and the catheter withdrew on the first occasion a quart of foul-smelling pus containing urine, and a week later, when an attempt was made to catheterize her again, a piece of gauze was discovered in the urethra. This was pulled out and proved to be a surgical gauze sponge about 2 inches wide and 10 inches long. The symptoms immediately subsided. In a week's time she was well, cystostomy revealing a very small, almost completely healed fistula in the right side of the bladder. The mass could no longer be felt in the pelvis. In a week the patient left the hospital, and has remained perfectly well.

Malignant Papilloma of Gallbladder

DR. T. P. WARING, Savannah, Ga.: A woman, aged 42, had two attacks of puerperal insanity, one of them after an abortion. She had an attack of jaundice after the second attack of puerperal insanity. She has borne four children, three of them without trouble. The family history is negative as to cancer. The present trouble dates back three years, and starts with pain in the right hypochondrium and a feeling of relief on pressure. Three weeks before admission to the hospital, she felt a lump in the right side, followed a few days later by pain, which was not severe. There was no fever nor jaundice. The only symptom of cholecystitis was a constant feeling of indigestion. A distinct globular mass could be felt in the right hypochondrium, which was a little sensitive to pressure, but otherwise caused no discomfort. At operation a large gallbladder was found, rather dark in color and glistening; the walls were not very thick. Several masses could be felt in the gallbladder; and two small lumps along the cystic duct forming part of the tumor mass, apparently in the gallbladder itself, later proved to be enlarged lymph glands. The pathologist reported papilloma. The subsequent history bears out the malignancy of the papilloma, for although the dissection was clean and no other enlarged glands could be felt, the patient developed an obstructive jaundice three months later. This was relieved by establishing a hepaticoduodenal anastomosis over a rubber catheter, making use of the sinus wall to attach to the duo-

denum, covered and protected by the gastrohepatic and greater omentum. This gave absolute relief for four months. The patient declined further operation, and died two months later from the obstruction.

Congenital Diverticula of Intestine, with Tumor

DR. WILLIAM T. BLACK, Memphis, Tenn.: A fibromucous peritoneal polyp, weighing 4,260 gm., occurring in a woman, aged 59, was discovered during operation. This tumor sprang from the peritoneal coat of the tip end of an apparently congenital diverticulum in the lower sigmoid. A preoperative diagnosis was made of subserous uterine myoma, with cystic degeneration, or an ovarian tumor. The growth probably can be attributed to an embryologic condition or fetal "rest," or it might have followed a diverticulitis, ulceration or perforation of the diverticulum.

Resection of Cecum and Ascending Colon

DR. J. SHELTON HORSLEY, Richmond, Va.: I wish to call attention to the triangular space at the mesenteric border of the intestine which is sometimes infected by the operator before it is closed, and to the necessity of cleaning the bowel ends with antiseptics before suturing. A valve should be made when the small bowel is united to the large bowel. There is used a new operation based on these principles in which the end-to-end method is used and the ileum is projected into the end of the transverse colon and sutured in a manner similar to that used in my method of uniting the small bowel. In addition to this, in order to promote valve formation and increase safety, there is placed a row of interrupted mattress stitches of catgut. To relieve gas accumulation I suggest an enterostomy after the Coffey principle. I have done seven resections of the cecum and ascending colon in ten years. All these patients recovered from the operation satisfactorily. Two of the operations were for intussusception in infants, two for severe intestinal stasis, and three for hypertrophic tuberculosis. In one of the cases of tuberculosis a resection of several feet of diseased ileum was made after the cecum and ascending colon had been removed, thus making a double resection in this case.

Practical Considerations in Regard to Permanent Colostomies

DR. W. E. SISTRUNK, Rochester, Minn.: At present we are making a colostomy very similar to the one described by Mixter. This colostomy is, as a rule, made through a straight incision placed below and about 1 inch to the left of the umbilicus. It may be made through a low midline incision. The colostomy is made in a loop of the sigmoid flexure. After the loop has been lifted out of the abdominal cavity, an incision from 1½ to 2 inches long is made through its mesentery parallel to the direction of the blood vessels and extending upward nearly to the bowel. A second incision, about 1 inch long, is then made across the end of the first incision quite near the mesenteric attachment of the bowel. Two strips of gauze are placed in the upper end of the T incision which has been made, and when these are pulled apart a good sized opening is made through the mesentery. The two sides of the entire abdominal wall near the center of the incision are sutured through this opening in the mesentery. The remaining portions of the incision are then closed, a small bit of the bowel being included in two of the sutures to prevent the possibility of herniation of a loop of small intestine.

After removing the gauze, a glass rod or rubber tube is placed through the opening in the mesentery between the skin and bowel to serve later as a guide in cutting across the bowel. If necessary for gas distention, a small opening may be made in the bowel any time after twenty-four or forty-eight hours, and after five or six days the bowel is cut across completely with the cautery. As a rule, however, the patients pass gases very readily through the knuckle which has been brought up, and it is unnecessary to disturb it before five or six days. After the loop has been cut across it is found that the two ends of bowel are separated by the entire abdominal wall for a distance of from 1 to 2 inches. These ends protrude from 1 to 1½ inches above the skin. They may later be cut shorter if thought necessary.

Standardization of Rural Hospitals

DR. ISAAC S. STONE, Washington, D. C.: I am in favor of bringing the standard of all hospitals, whether large or small, up to that point which will afford the best service to the public and which will require the best medical and surgical training of the staff. Sufficient information has been collected to show the number of poorly equipped hospitals in all parts of the country, in towns and rural districts. Many of these hospitals are but little better than boarding houses without the essential equipment of house staff or laboratory, or, indeed, anything that justifies the name of hospital. It was suggested that all hospitals should be inspected by the health officer or commissioner of health, whether they are public or private institutions, and in case they are found up to the standard of requirement they should be duly licensed and required to send in a full report of the treatment of all cases during each year. I also favor state aid to rural hospitals when necessary, to provide hospital relief in country or remote outlying districts. Especial attention should be given to consideration of rural hospitals as social service centers and for the care of obstetric patients whose homes are remotely situated or who are unable to obtain competent professional attendance.

Treatment of Tumors of Upper Jaw with Cautery

DR. J. C. BLOODGOOD, Baltimore: Comparison of the results of operations for the removal of tumors of the upper jaw with the knife alone and results of the removal of identical tumors with the cautery discloses a decided decrease in the mortality. When we have accomplished cures it has been with less mutilation. Whether the actual number of cures has been increased cannot be stated at the present time. In many instances it is safer to remove the disease in stages.

It is remarkable how much can be done under local anesthesia alone. When a general anesthetic is necessary, chloroform, in my experience, seems to meet the indications best. It does not interfere with the use of the cautery. It is the best anesthetic when operations are performed in the region of the oral cavity. It should never be pushed to complete narcosis. The patient has no memory of pain, and although he is so lightly under the influence of the anesthetic that all reflexes are active, he remains more or less quiet. When chloroform is not pushed to complete narcosis, the danger seems practically eliminated, and the operations can be repeated at intervals of three or four days. In some of my cases there have been as many as fourteen operations. The pulse and blood pressure are recorded every five or ten minutes. The chloroform is rarely administered longer than one hour. When the cautery instead of the knife is employed, the operation can be discontinued at any moment.

The duration of the operation and the number of operations largely depend on the condition of the patient and the local extent of the neoplasm. When the cautery is employed it is possible to remove the tumor piecemeal and to destroy from the tumor tissue into the surrounding healthy tissue without danger of dissemination; while with the knife one must give the tumor tissue a wide margin and remove the entire mass *en bloc* at one operation. In the removal in stages with the cautery it is also possible to have microscopic control as an indication that enough has been done.

The new growth should be attacked with the cautery from two points: 1. One should burn the tissue at the border of the tumor. This not only destroys the infiltrating area, but excites in the healthy tissue beyond a granulation tissue which of itself is largely protective against secondary invasion, at least during the period of complete removal. 2. The second attack should be on the new growth itself, if possible, from the center out. These two methods of attack are varied according to the size of the neoplasm and its local growth, and the anatomic character of the surrounding uninvolved tissue.

Radium Therapy

DR. HOWARD A. KELLY, Baltimore: Some of the cases treated successfully with radium by me and my associates

were: multinodular ovarian carcinoma; posterior mediastinal sarcoma, which had led to paraplegia; cervical Hodgkin's disease; universal Hodgkin's disease; medullary carcinoma of right breast and of glands of axilla and neck; extensive carcinoma of breasts; squamous cell cancer of larynx; extensive basal cell carcinoma of larynx causing obstruction; round cell sarcoma of tonsil and pharynx; unilateral tonsillar hypertrophy or round cell sarcoma; squamous cell epithelioma of mouth and of skin.

Treatment of Hodgkin's Disease

DR. CURTIS F. BURNAM, Baltimore: During six years I have seen and treated more than 100 cases of Hodgkin's disease and malignant lymphoma. I advise against extensive operative removals. I employ radium treatment supported by rest in bed, forced feeding and iron. When radium is not available I urge the use of the roentgen ray. Better results are obtained when tissue examination is characteristic of lymphosarcoma than when it shows definite Hodgkin's disease. Also, in Hodgkin's disease the results are better when the polymorphonuclear leukocytosis characteristic of extensive Hodgkin's disease has not developed. Treatment is much more satisfactory in chronic than in acute cases. No routine treatment applicable to all cases can be prescribed. Each patient must be given individual attention. The best guide to treatment is to be found in the effects of the gland masses, the blood and the genral health of the patient. Gamma radiation at distances of from 1½ to 5 inches from the surface with amounts of radium varying from 500 mg. to several grams, the time of exposure being inversely proportional to the amount of radium employed, is indicated. The radiation should be carried out so that every affected part may receive adequate dosage, and the treatment should be repeated at intervals until all evidence of disease has disappeared.

The results obtained are highly encouraging. In cases in which lymphosarcoma was diagnosed, two patients have been well for more than five years, one with extensive neck, and one with abdominal, involvement; four have been apparently well for over three years, one with pharyngeal and neck involvement, one with mediastinal, one with tonsil, neck and groin, and one with neck and axillary involvement. One patient with mediastinal and neck involvement has been well for four years, and two patients for more than three years. One of these had neck, axilla, groin and iliac, and the other groin, axillary, neck and mediastinal involvement.

Reconstruction of Uterus

DR. CHARLES R. ROBINS, Richmond, Va.: The blood supply of the uterus and the tubes entering from the sides makes it possible to remove as much of the intervening portion as may be necessary. The only thing necessary to leave is a continuous cavity from the tubes to the external os. This operation can most frequently be practiced in the treatment of fibroids. It is not intended that it should be generally used, because the cases in which it is indicated or possible are comparatively few. However, in young unmarried women and in married women who have not borne children, the operation would be justified often in whatever risk we might entail of unsatisfactory results or later development of fibroids.

Gynecologic Pelvic Drainage

DR. J. WESLEY BOVÉE, Washington, D. C.: There is still much need for the use of drainage material in pelvic surgery, preferably by the vaginal route. For this purpose I prefer to use paraffin-stearin gauze (Fisher). The chief advantages claimed for it are its nonadhesion to the tissues and consequent easy and painless removal, and its permitting endothelialization of denuded areas of pelvic peritoneum without the formation of lasting adhesions.

Visceroptosis

DR. CHARLES L. BONIFIELD, Cincinnati: Some of my cases of ileosigmoidostomy have been under my observation for five years and are still doing well. In none have I found it necessary to remove the colon, although the colon was removed in one case by another surgeon while I was out of the city. I have always felt that his youthful enthusiasm led him to do an unnecessary operation. Some of the patients have had slight trouble with feces getting into the colon above the anastomosis, but in none of them has it been serious, and as time went on it became less and less frequent. I performed cecosigmoidoscopy on three patients, but my results were not as satisfactory as those obtained from ileosigmoidostomy. A large part of the fecal current continued to flow through the old channel and produced the old symptoms. The result of my study and experience with this condition would lead me to believe that many cases require no surgical treatment; that others require operative treatment only for the pelvic condition; others will require fixation of the kidney as well. For the type in which colonic stasis is most severe, ileosigmoidostomy is the best procedure yet devised; the colon should be removed at a second operation, and only when symptoms make it necessary.

Treatment of War Wounds in the Hospitals of the American Expeditionary Forces

COL. CHARLES H. PECK, M. C., U. S. Army: The scientific treatment of war wounds was developed greatly during the second and third years of the war in the French, British and Belgian services. It passed from the stage in which all wounds suppurated profusely, to the discovery of the Carrel-Dakin method of chemical sterilization, and later to the method of early "débridement," healing by first intention in a large percentage of cases. Successful early débridement depends on well equipped operating hospitals near the fighting line; on conditions of combat and transport which permit of evacuation of the wounded from the field to the operating hospital in less than fifteen hours, and on an adequate number of skilled operating teams to care for all wounded promptly in time of battle. These conditions have been met in the French and British services by the evacuation hospital and the casualty clearing station, established from eight to twelve miles behind the lines, and by large numbers of mobile operating teams which were moved as needed to meet the changing demands of battle at different points.

The American service was developed on similar lines, but soon had to meet the changed condition of open warfare as contrasted with the fixed line of trench fighting which had existed for more than two years. In open warfare the frequent delays in evacuating wounded from the field, the difficulty of providing for early operation near the front for all cases needing it, the necessity of using small mobile hospitals, and improvised operating units in field hospitals, instead of well organized evacuation hospitals, has interfered seriously with the ideal treatment of war wounds. In spite of these difficulties and new problems, the Medical Department of the American Expeditionary Forces has met the situation in a masterly way; has provided adequate hospitalization and skilled surgeons for the care of the wounded, and has performed this gigantic task for an army of 2,000,000 men with a minimum amount of confusion and delay. The excellent morale and physical condition of returning overseas wounded is evidence of the efficiency of the service.

Limitations of Cesarean Section

DR. E. GUSTAV ZINKE, Cincinnati: Abdominal cesarean section is positively indicated in all cases in which the child cannot be delivered by any means, dead or alive, through the parturient canal. The operation is not only justifiable, but almost imperative, and should be selected as the best mode of delivery in all cases of deformed, narrow and contracted pelves in which the diameters are so reduced in size as to forbid the test of labor, the use of the high forceps, or version of the child on the feet. Abdominal hysterectomy will furnish the best results for both mother and child in all cases of placenta praevia in which the hemorrhage is either profuse or moderate and protracted, and beyond control. When an elongated or unobliterated cervix or rigid os complicates placenta praevia, cesarean section is all the more imperative. Fortunately, in the majority of these cases, the hemorrhage may be arrested effectually; elongated cervices are quite rare; and an unobliterated cervix, or rigid os usually yields to well applied tamponade or the careful and

skilful use of the rubber bag. Cesarean section may be chosen as a just procedure in cases of sudden and profound eclampsia, or severe toxemia in a primigravida when associated with an elongated or unobliterated cervix, acute suppression of the urine, general edema, and cyanosis. In the milder cases of this disease, when the life of the child is considered equally as important as, or more important than, the life of the mother, the operation finds a justification. This fact, more than anything else, renders cesarean section almost entirely unnecessary in the treatment of eclampsia. In cases of asthenia, both lives may be saved occasionally by performing this operation. In the past, cesarean section was not resorted to often enough; at present, it is performed too frequently. Cesarean operation should never be performed without the consent of an experienced consultant of recognized standing and an authority on obstetrics.

Judging from the favorable results reported by men who have performed cesarean section when the patients showed symptoms of infection, one is led to believe that the cases in which recovery did take place were not really of the type classified as true septic infection, but rather that they were cases of mild sapremia. A strictly septic infection is always systemic and almost invariably fatal; a sapremia is, usually, local in character, and the patient recovers notwithstanding the cesarean section.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

December, 1918, **16**, No. 6

1 *Standards for Growth and Nutrition. L. E. Holt.—p. 359.
2 Experimental Research on Effect on Gastro-Intestinal Tract of Excretion of Poisons, Considering the Age of Animals. N. Okubo.—p. 376.
3 New Apparatus for Puncture of Superior Longitudinal Sinus. A. Goldbloom.—p. 388.
4 Tertian Malaria in Two Infants Under Two Months of Age. C. J. Bloom.—p. 391.
5 Recent Work in Anatomy, Physiology and Pathology of Childhood. J. B. Holmes.—p. 393.

1. Abstracted in THE JOURNAL, July 20, 1918, p. 221.

American Journal of Insanity, Baltimore

October, 1918, **75**, No. 2

6 *Central Canal of Spinal Cord. S. P. Kramer.—p. 193.
7 *Content of Schizophrenic Characteristics Occurring in Affective Disorders. P. Greenacre.—p. 197.
8 Food, Service and Conservation in Provincial Hospital. J. C. Mitchell.—p. 203.
9 *Pellagra at Connecticut Hospital for Insane. W. C. Sandy.—p. 211.
10 Summary of 106 Cases of Mental Disorder of Unknown Etiology Arising in Fifth and Sixth Decades. E. T. Gibson.—p. 221.

6. **Central Canal of Spinal Cord.**—Of 206 spinal cords examined by Kramer the central canal was open throughout in fifteen instances, or 7.23 per cent. He has shown in previous studies how it is possible for a poison or an infective agent to reach the meningeal surface of the cord and the central gray matter and leave the rest of the cord unaffected; that it is possible for disease to spread through the medium of the cerebrospinal fluid upward, through the central canal and by diffusion therefrom into the central gray matter. Poliomyelitis is a disease of childhood. An ascending paralysis may also occur in adults though more rarely than in children. Kramer has also examined the cords from four cases of poliomyelitis in children and found the central canal patent in all of them.

Experiments were also performed in which it was sought to produce the condition found in acute poliomyelitis by injection into the spinal canal of dogs of small doses of dilute, 2 per cent. hydrocyanic acid (1 c.c.). On making this injection a motor paralysis of the posterior extremities, usually more marked on the left side, is produced. Such animals have been kept alive for a varying number of days, the motor paralysis persisting, sensation remaining unaffected. When the cords of these animals are examined, lesions typical of poliomyelitis are found. There is chromatolysis of the anterior horn cells, acute inflammatory exudate throughout the gray matter and in the perivascular lymph spaces, the central canal filled with a like exudate and a replacement fibrosis in the anterior horns.

7. **Content of Schizophrenic Characteristics.**—Summarizing in general review the content of the schizophrenic characteristics in cases showing dominantly an affective reaction, Greenacre emphasizes: (1) the prominence in depressions of the symptom constellation of ideas of reference with delusions of persecution and condemnatory hallucinations; (2) an analogous projection of the affect in the varied and dramatic hallucinations; the symbolistic attitudinizing, and the somewhat egotistical and constantly changing ideas of reference of the elation; (3) the determination of the content of the distortions of body sense and of the odd, fixed antic behavior by the underlying conflicts and personal difficulties.

9. **Pellagra at Connecticut Hospital for Insane.**—Five cases of pellagra are cited by Sandy. The first case, one of dementia praecox, paranoid form, after a hospital residence of over two years, presented the skin and mucous membrane signs of pellagra of a mild type, following persistent dietetic indiscretions. The physical signs of pellagra promptly disappeared when the patient was placed on a rational diet, there still remaining, however, a few quite characteristic sequels. The second case, also one of dementia praecox, but hebephrenic form, after a hospital residence of about two years, during a part of which time she had to be tube fed, developed the characteristic skin and mucous membrane appearances of pellagra. She was also tuberculous and finally died, the pellagra symptoms becoming more and more marked. The third case, one of dementia praecox, after some years of hospital residence in several institutions, developed pellagra symptoms. For several months prior to this she had persistently refused food and was tube fed. She failed to respond to treatment, death occurring about a month after the appearance of the characteristic symptoms.

The fourth case was one of dementia praecox. The patient had a positive blood Wassermann and had been given a series of mercurial injections. One month following the last injection the Wassermann had become negative, and about five months after admission, the peculiar skin eruption and mucous membrane changes made their appearance. This patient also developed an intractable diarrhea and died in about ten days after the eruption was first noticed. The fifth case was a rather high-grade feebleminded female with congenital absence of the palate and a positive blood Wassermann. Following a hospital residence of over five years, she developed the peculiar and symmetrical scaliness of the backs of the hands, associated with inflammation of the oral and genital mucous membranes and gastric disturbances. She had received mercurial injections, the last dose being given about two weeks before the development of the physical signs resembling pellagra. The skin and mucous membranes improved under treatment but the patient finally died a month later from cardiac degeneration. The patient appeared well nourished and there was considerable subcutaneous fat even at the time of death.

American Journal of Physiology, Baltimore

December, 1918, **47**, No. 3

11 *Chemical Stimulation of Cerebral Cortex. S. S. Maxwell.—p. 283.
12 *Blood-Pressure Curve Following an Intra-Spinal Injection of Epinephrin. J. Auer and S. J. Meltzer.—p. 286.
13 Metabolic Gradient Underlying Colonic Peristalsis. W. C. Alvarez and E. Starkweather.—p. 293.
14 *Blood Volume By Acacia Method. W. J. Meek and H. S. Gasser.—p. 302.
15 Intracellular Respiration. Rates of CO_2 Production by Starved and Fed Paramecia: Possible Relation to Rates of Oxidation in Unfertilized and Fertilized Sea Urchin Egg. E. J. Lund.—p. 318.
16 *Two New Factors in Blood Coagulation-Heparin and Pro-Antithrombin. W. H. Howell and E. Holt.—p. 328.
17 *Influence of Secretin on Number of Red and White Corpuscles and Ferments and Sugar Content of Blood. B. Fujimoto.—p. 342.

18 Influence of Ingestion of Amino-acids, Adequate and Inadequate Proteins on Production of Catalase. W. E. Burge.—p. 351.
19 Regeneration of Blood Serum Proteins. Influence of Fasting on Curve of Protein Regeneration Following Plasma Depletion. W. J. Kerr, S. H. Hurwitz and G. H. Whipple.—p. 356.
20 Id. Influence of Diet on Curve of Protein Regeneration Following Plasma Depletion. Id.—p. 370.
21 Id. Liver Injury Alone; Liver Injury and Plasma Depletion: The Eck Fistula Combined with Plasma Depletion. Id.—p. 379.
22 Normal Growth of White Leghorn Chickens. G. D. Buckner, R. H. Wilkins and J. H. Kastle.—p. 393.
23 *Secretin. Number of Red and White Corpuscles in Circulating Blood During Digestion. A. W. Downs and N. B. Eddy.—p. 399.
24 *Possible Periodic Variations in Extent of Knee-Jerk in Women. J. L. King.—p. 404.

11. **Chemical Stimulation of Cerebral Cortex.**—Maxwell found that tetraethylammonium chlorid is not only a stimulant for medullated nerves, but that it is a more powerful stimulant of gray matter than creatin though less powerful than strychnin. Without any exception the contractions resulting from the action of the tetraethylammonium chlorid preceded by several minutes those caused by the creatin on the opposite side. In every instance a 1 per cent. solution of strychnin applied to the cortex on one side brought about the characteristic twitchings and convulsive contractions more promptly than the concentrated solution of tetraethylammonium chlorid applied to the other side. In a few experiments comparisons were made between tetraethylammonium chlorid and sodium citrate or sodium oxalate. In none of these was there any indication that the citrate or oxalate had a stimulating effect.

12. **Effect of Epinephrin on Blood Pressure.**—Intraspinal injections of 1 c.c. or 1.5 c.c. of epinephrin in the lumbar region of monkeys cause a rise of blood pressure distinctly different in character from the curve obtained after the intravenous injection of epinephrin. The curve of blood pressure following an intraspinal injection is generally characterized by a slow rise from the original level to the maximum height; by a plateau-like duration of the maximum; by a slow fall to the blood pressure which prevailed before the injection of epinephrin. An intralumbar injection causes a much more lasting effect on the rise of blood pressure than an intravenous injection. As a rule, after intraspinal injections the pressure at the end of the pressor effect has not been observed to fall below the original level. In human beings an intralumbar injection can be carried out with greater safety and certainty than in monkeys, hence the advisability of such studies in clinical physiology is quite evident.

14. **Blood Volume by Acacia Method.**—This method depends on an injection of a known amount of acacia into the blood stream and a determination of the dilution undergone by the acacia after time for mixing with the blood has been allowed. The acacia has been determined as furfurolphloroglucid by the method of Korber. The injection of 4 c.c. of 20 per cent. acacia per kilogram has been shown to be harmless to the animal; neither does it expand the blood volume during the time necessary for a determination.

16. **Blood Coagulation: Heparin and Pro-Antithrombin.**—The two new fibrin factors discovered by Howell and Holt are: First, a phosphatid, not previously described, which exists in various tissues but is found in greatest abundance in the liver. This phosphatid is designated as heparin to indicate its origin from liver. It inhibits coagulation, partially or completely according to the concentration. Second, a substance present in blood plasma and blood serum which is converted into antithrombin by a reaction with heparin. Just as in plasma and serum there is a mother substance from which thrombin is formed, so there is an antecedent substance from which antithrombin is formed. By analogy this substance is designated as pro-antithrombin. Prothrombin is activated to thrombin by calcium, the pro-antithrombin is activated to antithrombin by heparin. Heparin may be obtained from lymph glands and it has been detected by its reactions in the uterine mucous membrane. It is present in largest amounts in the liver, especially the dog's liver. Heparin inhibits clotting mainly by preventing the activation of prothrombin to thrombin. It acts as an antiprothrombin rather than as an antithrombin. The action of heparin in preventing the activation of prothrombin and in causing the activation of pro-antithrombin is not destroyed at a temperature of 100 C. Pro-antithrombin in blood plasma is destroyed promptly by heating to 70 C. and more gradually by prolonged heating at lower temperatures, 60 C. Pro-antithrombin may be precipitated uninjured from blood plasma by acetic acid or by ammonium sulphate added to one-half saturation.

On the theoretical side, it is suggested that heparin and pro-antithrombin are normal constituents of the circulating blood (not demonstrated for the heparin) and together fulfill the function of safeguarding the fluidity of the blood, that is to say, of preventing intravascular clotting. The pro-antithrombin by its conversion to antithrombin provides a protection against any small quantities of thrombin that may arise in the circulating blood (metathrombin formation). The heparin in addition to functioning as a specific activator to pro-antithrombin exerts an inhibiting influence on the conversion of prothrombin to active thrombin. When blood is shed or when in other ways thromboplastic substance (cephalin) is added to the blood the protection afforded by the heparin is overcome and thrombin is formed in amounts sufficient to cause clotting. It is suggested by the authors that variations in the amount of heparin in the blood may suffice to explain some of the known abnormalities in coagulation, hemophilia, for example.

17. **Effect of Secretin Injections in the Rabbit.**—Fujimoto found in his experiments that secretin, when injected subcutaneously, produces an increase in the number of red and white corpuscles in the circulating blood of rabbits, as Downs and Eddy proved. The hypodermic injection of 1 c.c. of secretin causes an increase in the catalase content of the blood. Neither increase nor decrease in the diastase, glycolytic ferment and sugar of the blood was observed after the hypodermic injection of 1 c.c. of secretin.

23. **Blood Count During Digestion.**—During digestion there occurs an increase in the number of both the red and white corpuscles per unit volume of blood. Downs and Eddy found that these changes are comparable with the effects produced by the experimental administration of secretin. The source of the increased corpuscle content of the blood both in digestion and after the administration of secretin is an increased rate of production of new cells by the bone marrow. The similarity between the differential leukocyte counts in digestion and after the administration of secretin is additional evidence of secretin being the cause of the increase in the number of corpuscles during digestion.

24. **Periodic Variations of Knee-Jerk in Women.**—If the knee-jerk may be taken as a physiologic index of the tone of the nerve centers, the evidence obtained by King points in the direction of the conclusions, that there is a period of hyperexcitability immediately preceding, accompanying or following menstruation and that there is then a tendency toward a fall and an approach to an intermenstrual average.

Annals of Otology, Rhinology and Laryngology, St. Louis

September, 1918, **27**, No. 3

25 Aviation Service of Medical Department of Army. T. C. Lyster.—p. 851.
26 Otolaryngology in Army Medical Service. N. H. Pierce.—p. 856.
27 Early Laryngology in Philadelphia. J. S. Cohen.—p. 862.
28 Surgical Pathology of Mastoid. J. C. Beck.—p. 869.
29 New Camp Disease of Larynx: "Pneumococcus Ulcerative Laryngitis." F. D. Owsley.—p. 874.
30 Value of Ear Examination to Neurologist. I. H. Jones.—p. 881.
31 Types of Mastoid Structure with Reference to Their Differentiation By Means of Stereoradiography. F. N. Bigelow.—p. 887.
32 Influenza in Switzerland. J. Holinger.—p. 968.
33 Sinus Thrombosis Which Presented Unusual Difficulties in Diagnosis. E. R. Faulkner.—p. 970.
34 Leukocytosis of Spinal Fluid in Diagnosis of Meningitis. C. E. Perkins.—p. 974.
35 Benign Neoplasms of Nasal Septum. G. W. Mosher.—p. 981.
36 Radium in Diseases of Ear. T. J. Harris.—p. 986.

Boston Medical and Surgical Journal

Dec. 26, 1918, **179**, No. 26

37 Influenza Among Children As Seen in Hospital Ward. F. B. Talbot.—p. 779.
38 Influenza Among Children As Seen in Private Practice. A. A. Howard.—p. 783.

39 Epidemic Meningitis Situation at Camp MacArthur. L. S. Medalia. —p. 787.
40 Continuous Inhalation of Oxygen Gas in Pneumonia and In Other Diseases. A. N. Blodgett.—p. 798.
41 Loss of Faith As a Woeful Outcome of Today's Specialism. B. Robinson.—p. 799.

Bulletin of Johns Hopkins Hospital, Baltimore

December, 1918, **29**, No. 334

42 *Aseptic End-to-End Anastomosis of Intestine. E. G. Grey.—p. 267.
43 Anomalies of Pulmonary Veins. P. B. MacCready.—p. 271.
44 *Relation of Supplying Ovary to Causation of Sex. J. G. Murray, Jr.—p. 275.
45 Piston Action of Vertebral Column Developed in Certain Types of Cranial Fractures. N. W. Sharpe.—p. 281.

42. **Aseptic Anastomosis of Intestine.**—Grey's paper is based on the results obtained from using the bulkhead suture (Halsted) in thirty-seven dogs. A new wire release ligature and a bolus of fibrin which is easily sterilized have been substituted for the paper cones. Specimens were secured following the operations at intervals varying from a few hours to 106 days. A study of the process of healing shows the following points: The process of repair in the bulkhead suture may, under favorable circumstances, lag but little behind that noted in the plain end-to-end anastomosis. On the average, however, the healing is a little slower in the former. A large inturn may not materially lengthen the period of regeneration, provided that the two inverted bowel ends remain about equal in size. The size of the inturn remaining after several weeks varies greatly from specimen to specimen. Frequently very little inverted bowel is found at this time. As a rule, there is a considerable delay in the repair of the mucosa when the two parts of the inturn are of unequal length, owing to poor approximation or to an inequaltiy in the necrosis on the two sides. This, however, does not appear to affect the function of the intestine. No striking difference was noted in the rate of repair between bulkhead sutures in which the cautery had been used and those in which the knife had been substituted for it. Stitches which puncture the epithelium usually delay the healing of the latter. Frequently such sutures carry a prolongation of the epithelium down into the deeper layers. Such adenoma-like prolongations may weaken the line of union where only one layer of stitches has been inserted.

44. **Relation of Supplying Ovary to Causation of Sex.**—The records of some 17,500 deliveries occurring in the Obstetrical Clinic of the Johns Hopkins Hospital from September, 1896, to March, 1918, were searched by Murray for suitable cases by which the principal theory advanced by Dawson could be tested. All those cases in which the location of the corpus luteum was actually demonstrated at cesarean section, at laparotomy for therapeutic abortion, at laparatomy within two weeks after delivery, or at postmortem examination, and in which there was no question as to the sex of the child, were tabulated. In all, seventy-five suitable observations were made on seventy women, five women each having two pregnancies. The corpus luteum was found to be in the right ovary in thirty-eight of the cases, and in the left ovary in thirty-seven of the cases. In 68 per cent., or in twenty-six, of the cases in which the corpus luteum was located in the right ovary the child was male, while in the remaining 32 per cent., or twelve cases, the child was female. On the other hand, in 57 per cent., or in twenty-one, of the cases in which the corpus luteum was located in the left ovary the child was male, while in the remaining 43 per cent., or in sixteen, of these cases the child was female. In this series there were forty-seven male and twenty-eight female children, 63 per cent., and 37 per cent., respectively. For the forty-seven males the corpus luteum was found in the right ovary in twenty-six, or 55 per cent., and in the left ovary in twenty-one, or 45 per cent.; while for the twenty-eight females the corpus luteum was found in the right ovary in twelve, or 43 per cent., and in the left ovary in sixteen, or 57 per cent.

From these figures Murray concludes that Dawson's theory cannot be correct, and, considering that the majority of the children in this series of cases are male, it is also clear that babies of either sex result in about equal numbers from the fertilization of an ovum from either ovary. Furthermore, clinical evidence shows that the determination of sex is probably not due to any factor present in the unfertilized ovum. The "chromosome theory" must be considered the only explanation of the causation of sex at present acceptable. The sex of an unborn child cannot be foretold, nor can either sex be produced at will, by any rules known at present.

California State Journal of Medicine, San Francisco

December, 1918, **16**, No. 12

46 Intracranial Complications of Diseases of Ear, Nose and Throat. Report of Cases with Necropsy Findings. H. Hastings.—p. 520.
47 Dispensary Treatment of Diabetics. A. S. Granger.—p. 524.
48 Prophylactic Treatment with Silver Nitrate for Blennorrhea Neonatorum. A. B. Spalding.—p. 526.
49 Acute and Subacute Unilateral Infectious Nephritis Without Pyuria from Affected Side. R. V. Day.—p. 528.
50 Results from Pertussis Vaccine. B. J. Condit.—p. 529.

Florida Medical Association Journal, St. Augustine

November, 1918, **5**, No. 5

51 Circulation. D. Forster.—p. 79.
52 Endocarditis. R. R. Niblack.—p. 80.
52 Anatomy of Circulatory Apparatus. J. E. McGunagle.—p. 82.
53 Indications for Hysterectomy. H. Crutcher.—p. 82.

Georgia Medical Association Journal, Atlanta

November, 1918, **8**, No. 7

54 Thrombo Angiitis Obliterans. Report of Cases. S. J. Sinkoe. —p. 131.
55 Nasal Cases Probably Due to Syphilis. D. Roy.—p. 137.
56 Tragic Complications of Stomach and Duodenal Ulcer. E. G. Jones.—p. 144.
57 So-Called Marginal Eczema. C. Swanson.—p. 148.

Iowa State Medical Society Journal, Des Moines

Dec. 15, 1918, **8**, No. 12

58 Pneumonia and Its Complications at Base Hospital Camp Dodge. J. L. Miller.—p. 419.
59 Pathology and Diagnosis of Diseases of Hematopoietic System. W. E. Sanders.—p. 423.
60 Therapeutic Aspects of Diseases of Hematopoietic System. F. J. Rohner.—p. 426.
61 Tuberculosis. J. W. Kime.—p. 431.
62 Epidemiology of Influenza. J. H. Hamilton.—p. 436.

Journal of Laboratory and Clinical Medicine, St. Louis

December, 1918, **4**, No. 3

63 Epidemic of "Spanish Influenza" at Camp A. A. Humphreys, Va., During September and October, 1918. I. W. Brewer.—p. 87.
64 *The Salicylates. Specificity of Salicylate in Rheumatic Fever. P. J. Hanzlik, R. W. Scott and P. C. Gauchat.—p. 112.
65 Clinical Manifestations of Empyema. W. T. Vaughan.—p. 123.
66 Cocaine Poisoning. Report of Case with Necropsy. E. Kellert. —p. 129.
67 *Acute Suprarenal Insufficiency. Report of Case. W. Boyd.—p. 133.
68 Convenient Dilution Chart of Use in Serologic and Other Tests in Which Varying Quantities of Reagents are Employed. L. B. Taber.—p. 138.
69 Modification of Wassermann Test. C. N. Callary.—p. 140.

64. **Specificity of Salicylates in Rheumatic Fever.**—A study of the comparative effects of nonsalicyl and salicyl medication made by Hanzlik and his associates does not show that salicylate possesses any unusual action or peculiar specificity in rheumatic fever. Prompt, though partial, relief was obtained in the majority of the patients receiving drugs other than salicyl. This is true for both early and late symptoms of the disease. In some of the patients the symptoms persisted despite salicyl medication, and in at least four cases (two of nonsalicyl-salicyl series and two of salicyl) the condition recurred shortly after salicyl treatment. In those patients in whom the symptoms persisted, although considerably moderated, after treatment with nonsalicyl antipyretics and analgesics, salicyl appeared to give more permanent relief. On the other hand, in two of the patients the fever persisted in spite of the salicyl medication. In some of the patients the persisting antipyretic effect during salicyl medication (although other symptoms of the disease were present) may be due to the retention or delayed action of the nonsalicyl antipyretic. With four of the nine patients unquestionably no effective and permanent relief from the symptoms of pain, fever, swelling of the joints, and general discomfort, was obtained until salicylate was administered.

Eliminating the elements of time, rest, and natural recovery, it appears that the relief of later symptoms is brought about

more effectively and permanently by salicyl than by combinations of drugs whose pharmacologic actions are similar, but different chemically. The favorable reports of J. L. Miller with foreign protein and rest alone, and numerous recurrences of the disease in patients repeatedly treated with salicylate in large doses, lead the authors to the conclusion that salicylate possesses no thoroughly demonstrated specific action in rheumatic fever. It is no more than a symptomatic remedy which can be administered safely in very large doses, and represents a fortunate combination of both antipyretic and analgesic qualities which makes it much more suitable, and also desirable for the treatment of rheumatic fever than combinations of opiates and various antipyretics. The injurious effects of salicylate on renal function and the kidney might be raised against the promiscuous and unwarranted use of the drug, but its efficiency and desirability as a symptomatic remedy in rheumatic fever may be regarded as outweighing the seriousness of these disturbances.

67. **Acute Suprarenal Insufficiency.**—The patient was 38 years of age, performing the more or less arduous duties of a military training camp. Early one morning he was found in a semiconscious condition in his room. A few hours later he was admitted to the hospital. By this time he was sinking into a state of coma. The picture was one suggestive of cerebral hemorrhage. The limbs were rigid, the reflexes gone, and the pupils distinctly dilated. The face and hands were cyanosed. The temperature was 99 F. Urine was normal. Cerebrospinal fluid showed no change and gave a negative Wassermann reaction. The patient died two and a half hours after admission. The clinical course was thus apoplectiform in type.

The necropsy was performed within two hours of death. The only organs exhibiting any marked pathologic change were the suprarenals. These were almost entirely destroyed, and converted into structureless, amorphous, yellowish masses, firm in texture, and considerably larger than the original glands. On the right side no trace of suprarenal tissue, either cortex or medulla, could be found. On the left a narrow strip of gland not more than 2 mm. in width was present at one point. This consisted entirely of cortex, the cells of which contained a lipoid substance which stained red with Scharlach R, but which was not anisotropic. The remainder of the gland consisted of areas of necrosis surrounded by the endothelial and giant cells characteristic of tuberculosis. No trace of medullary substance remained. Attached to the caseous mass was a small nodule which showed the microscopic structure of a sympathetic ganglion. The nerve cells and fibers of this ganglion, stained by various methods, showed no abnormality, but there appeared to be some increase of fibrous tissue.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

November, 1918, **12**, No. 4

70 *Application of a Concentrated Solution of Magnesium Sulphate to Scalds and Burns. S. J. Meltzer.—p. 211.
71 Transparent Celluloid Renal Oncometer or Plethysmograph. E. W. Schwartze.—p. 215.
72 *Experimental Investigation of Cause of Early Death From Arsphenamin, and of Certain Other Features of Pharmacologic Action of Substance. D. E. Jackson and M. I. Smith.—p. 221.
73 *Mode of Action of Certain Stimulants in Increasing and of Certain Depressants in Decreasing Oxidation. W. E. Burge.—p. 243.
74 Adenine Mononucleotide. W. Jones and R. P. Kennedy.—p. 253.

70. **Application of Magnesium Sulphate to Scalds.**—Meltzer records results of experiments with external application in burns of a concentrated solution of magnesium sulphate carried out several years ago; the experiments were repeated since and similar results were obtained. The experiments were made on noninjured and nonshaved rabbits' ears. The animal was deeply anesthetized. About one third of each ear was submerged for a short period in hot water. Then the water was removed and one ear was submerged in a 25 per cent. solution of epsom salt (1 mol. $MgSO_4$+7 mol. of water) and the other ear was submerged in a solution of sodium chlorid (either 0.9 or 6 per cent.). The ears were kept submerged in these solutions for about two or three hours, the solutions being changed two or three times during this period. The experiments with submersion in water of temperatures between 56 and 63 C. have always shown that the inflammation of the ear which was submerged in $MgSO_4$ was undoubtedly retarded or nearly completely prevented.

Meltzer has also had occasion to see cases of burns in human beings. First and second degree burns were invariably arrested in their development when molecular solutions of $MgSO_4$ were applied early. Third degree burns, as a rule, ran a more favorable course under application of $MgSO_4$ than under any other treatment. Higher concentrations than 25 per cent. seem to exert a still better influence. The favorable action of the application of $MgSO_4$ in advanced stages of burns of second and third degree is less striking, especially on account of the infection present; but even in this stage it seems to exert a favorable influence and according to Meltzer ought to be used either in combination, or alternatingly, with antiseptics.

72. **Cause of Early Death from Arsphenamin.**—The earliest toxic symptoms noted by Jackson and Smith consisted in a dilatation of the heart, perhaps mainly of the right side at first, a progressively increasing pulmonary blood pressure, and a slow, gradual, but not severe, fall of the systemic pressure. The cause of this rise in pulmonary arterial tension they believe to be due partly to the alkalinity of the solutions of arsphenamin used, and partly to the specific action of the drug itself. With large toxic doses the right heart may have to contract against a pulmonary pressure increased by 100 per cent. above the normal, while at the same time the left ventricle may be contracting against a systemic pressure reduced by 25 to 50 per cent. below the normal. These peculiar conditions may tend to establish a state of increased irritability and instability in the heart, and in rare instances delirium cordis may result. The reactions of the internal organs when arsphenamin is injected are variable, and the reasons therefore are obscure. Apparently both central and peripheral influences are concerned. As a rule, oncometric tracings of the spleen and intestinal loop show a dilatation, while the kidney usually contracts, sometimes in a most vigorous fashion. The toxicity of arsphenamin is not increased by the breathing of high concentrations of carbon dioxid, nor by the injection of calcium hydrate, calcium lactate, or of monosodium phosphate. A number of intermediary compounds occurring during the process of manufacture of arsphenamin were studied by Jackson and Smith. None of these is very poisonous and they cannot account for the variable toxicity of different samples of arsphenamin which may or may not contain traces of one or more of these. The suggestion is made that in those cases in which severe, acute, toxic symptoms suddenly manifest themselves, either during or shortly after the intravenous injection of arsphenamin, tyramine is more likely to be of benefit to the patient than is any other known drug.

73. **Increasing and Decreasing Oxidation.**—Evidence is presented by Burge to show that depressants such as the narcotics decrease oxidation which may be the cause of the depression by producing a decrease in catalase, while stimulants such as caffein and theobromin produce an increase in oxidation which may be the cause of the stimulation by producing an increase in catalase. The fact that the action of caffein and theobromin is to produce an increase in catalase with resulting increase in oxidation while the action of the narcotics is to produce a decrease in catalase with resulting decrease in oxidation is offered as an explanation for the antagonistic action of these substances.

Journal of Roentgenology, Iowa City

October, 1918, **1**, No. 3

75 Tubercular Lesions of Lung Parenchyma. B. H. Orndoff.—p. 199.
76 Pigmented Mole Casting Shadow of Renal Calculus. N. G. Alcock.—p. 227.
77 Club Hand Deformity in Roentgenogram. A. Steindler.—p. 234.
78 Chest Roentgenograms. L. A. Marty.—p. 242.
79 Roentgenologic Method of Measuring Potentiality of Voice Resonance. G. N. Merry.—p. 227.
80 Squamous Celled Epithelioma Responding to Roentgen and Radium Therapy. B. Allen.—p. 264.
81 Left Bronchus Filled With Bismuth Paste. C. H. Ballard.—p. 271.

Journal of Urology, Baltimore

October, 1918, **2**, No. 5

82 Structure of Verumontanum. Origin and Development of Its Inherent Glandular Elements. E. M. Watson.—p. 337.
83 Experimental Gonococcal Infection in Animals. H. Culver.—p. 353.
84 *Repair of Urethral Defects by Tubular Grafts of Vaginal Mucosa. F. Legueu.—p. 369.
85 *Unique Type of Urethral Obstruction. A. B. Cecil.—p. 379.
86 *Tuberculosis of Mesenteric Lymph Nodes as Cause of Ureteral Obstruction. T. N. Hepburn.—p. 385.
87 *Experimental Pyelitis in Rabbit. H. F. Helmholz and C. Beeler.—p. 395.
88 Lean-Shaped Double Kidney. Rare Type of Dystopia and Fusion. A. R. Felty.—p. 421.

84. **Plastic Repair of Urethral Defects.**—Legueu reports three cases, the only ones, he says, of which he has knowledge, in which this procedure was employed. One patient showed as a result of several attacks of gonorrhea, multiple urethral strictures. As the results of instrumentation infection occurred, a perineal fistula developed and the penile urethra became totally occluded from perineal fistula to meatus, the meatus itself being completely obliterated. This part of the urethra was palpable as a fibrous cord as thick as a goose quill. The penile urethra was reconstructed by a tubular graft of vaginal mucous membrane. In the course of a colpoperineorrhaphy, a rectangular segment of vaginal mucosa was excised. This was dropped for a few moments in warm artificial serum, then rolled about a 26 F. bougie its edges caught with fine catgut so as to form a tube about 8 or 9 cm. long. The bougie carrying the graft was then introduced into a tunnel previously made in the glans penis when the sclerotic urethra was excised, and placed in the gutter left by the excision of the anterior urethra, care being taken to place the line of grafted suture in the angle of the two corpora cavernosa. The end of the bougie was introduced into the urethra and this sutured end to end to the graft by an interrupted catgut suture. The superficial tissues were united in two layers over the graft and a small drain left in place, the outer extremity of the graft being sutured to the meatus. The bougie was withdrawn on the morning of the third day. The operative result is excellent. In the other two cases equally good results were obtained.

Certain general preliminary conditions are essential to the success of the operation. They are the following: 1. The resection must be preceded by a temporary urethrostomy which involves the suture to the skin of both ends of the wounded urethra. After making this urethrostomy, several months must elapse before applying the graft in order to work on uninfected tissues. The orifices must also be dilated in order to prevent stricture. 2. Suprapubic cystostomy. It is preferable to establish this before the urethrostomy. Perineal diversion of the urine is not satisfactory since it leaves a more or less infected wound near the point of grafting. The tissue should be prepared by tunneling.

85. **Unique Urethral Obstruction.**—Striking the perineum on the corner of a box caused a tear of the bulb with the formation of a sac which occupied almost the entire perineum. The sac was lined with glistening mucous membrane throughout and extended up around the urethra into the region of the scrotum on either side. Portions of the bulb were found on either side of the sac. A new urethra was formed from the wall of the sac.

86. **Ureter Obstruction by Tuberculosis Mesenteric Lymph Nodes.**—In the three cases reported by Hepburn the gland was compressing the ureter. The diagnosis was made with the aid of the roentgen ray. Removal of the glands by operation gave relief in each case.

87. **Experimental Pyelitis in Rabbit.**—Pyelitis was experimentally produced by Helmholz and Beeler in the rabbit by the intravenous injection and by the intravesical injection of *Bacillus coli-communior* isolated from spontaneous pyelitis in the rabbit. Pyelitis was produced in seventeen of thirty-one rabbits injected into the ear vein. Ten per cent. of the rabbits had also abscesses in the kidney. Three rabbits had abscesses without a pyelitis. Pyelitis was produced in ten out of fifteen rabbits by intravesical injection. In only one instance were there abscesses in the kidney.

Kansas Medical Society Journal, Topeka

December, 1918, **18**, No. 12

89 Preparation of Laboratory Specimens and Interpretation of Laboratory Reports. W. A. Baker.—p. 289.
90 Spanish Influenza at University of Kansas. N. P. Sherwood.—p. 294.
91 Early History of Medical School of Kansas. L. E. Sayre.—p. 295.
92 Medical School, Profession and Public. M. T. Sudler.—p. 297.
93 Medical Education and Period of Reconstruction. C. F. Nelson.—p. 298.
94 The Dispensary. N. F. Ockerblad.—p. 299.
95 Venereal Clinic. N. F. Ockerblad.—p. 300.
96 Medical School and the Great War. E. M. Kibbey.—p. 301.

Medical Record, New York

Dec. 21, 1918, **94**, No. 25

97 Certain Types of Hemorrhagic Nephritis. L. Buerger.—p. 1057.
98 Sulphur Dioxid Treatment of Pulmonary and Laryngeal Tuberculosis. F. Tweddell.—p. 1061.
99 Medical Treatment of Enteroptosis. A. Bassler.—p. 1066.
100 Review of Medicine and Surgery of Twentieth Century. B. C. Keister.—p. 1068.
101 *Value of Saccharin as Food in Diabetes. W. E. Burge.—p. 1071.

101. **Value of Saccharin as Food in Diabetes.**—From his experiments, reported in this paper, the conclusion is drawn by Burge that saccharin, in addition to serving as a sweetening agent, serves to facilitate oxidation, and hence should be positively helpful, particularly in a disease such as diabetes, where the principal trouble is defective oxidation, instead of harmful, as some have claimed.

Modern Hospital, Chicago

December, 1918, **11**, No. 6

102 Epidemic Influenza and U. S. Public Health Service. R. Blue.—p. 423.
103 Out-Door Treatment of Spanish Influenza. W. A. Brooks.—p. 427.
104 Cooperative Economy Campaign in All Departments of the Hospital. A. S. Bacon.—p. 430.
105 Laundry System Which Has Proved Successful. L. S. Fish.—p. 433.
106 Venereal Disease Clinics. M. M. Davis, Jr.—p. 436.
107 Heating and Power Plant Economics for Hospitals. D. D. Kimball.—p. 437.
108 Hospitals and Hospital System of Chile. M. K. Chapin.—p. 440.
109 War-Time Economy Problem in Hospital. T. A. Devan.—p. 445.
110 Hospital Accounting. C. A. Porter and H. K. Carter.—p. 448.
111 Little Journeys to Places and People Worth Knowing. M. J. Robinson.—p. 454.

New York Medical Journal

Dec. 21, 1918, **108**, No. 25

112 A Bolshevik Bolus. W. P. Cunningham.—p. 1061. **To** be continued.
113 *Friedländer Bacillus Causative Factor in Bronchopneumonia Following Influenza. J. B. Rucker, Jr., and J. J. Wenner.—p. 1066.
114 Diagnosis of Sinus Thrombosis. A. Braun.—p. 1069.
115 Constipation Treatment of Pneumonia. E. E. Cornwall.—p. 1076.
116 Variation in Clinical Picture of Interstitial Keratitis. A. Brav.—p. 1078.
117 Knifeless Treatment of Piles. S. L. Katzoff.—p. 1081.

Dec. 28, 1918, **108**, No. 26

118 Preventive Medicine and Reconstruction of Race. F. Peterson.—p. 1105.
119 Results of Treatment in Six Hundred Cases of Appendicitis. G. P. LaRoque.—p. 1108.
120 A Bolshevik Bolus. W. P. Cunningham.—p. 1113.
121 Suggestions For Use of Certificates Showing Previous Infections in Control of Communicable Diseases. I. W. Brewer.—p. 1116.
122 Orthopedic Reconstruction Work on Hand and Forearm. A. Steindler.—p. 1117.
123 Successful Extraction of Opaque and Dislocated Crystalline Lens. H. F. Hansell.—p. 1120.
124 Lesions of Peripheral Nerves. C. G. Cumston.—p. 1120.

113. **Friedländer Bacillus.**—As a result of investigation of the sputum and of postmortem material from three typical cases of the malignant type of influenzal pneumonia, Rucker and Wenner feel that they are justified in saying that *B. influenzae* is the etiologic factor in the causation of the primary infectious influenza; that the secondary pneumonia and fatal terminations are due to the production of areas of bronchopneumonia caused by *B. mucosus-capsulatus*, otherwise known as the bacillus of Friedländer, and not by *B. influenzae;* and that *B. pestis* was not a factor in the etiology of the recent epidemic of influenza.

New York State Journal of Medicine, New York

December, 1918, **18**, No. 12

125 *Multiple Osteoma of Nasal Accessory Sinuses. Case Complicated By Syphilis. W. L. Culbert.—p. 465.
126 Primary Malignant Neoplasms of Lung and Pleura. M. Packard. —p. 472.
127 Some Irregularities of Heart and Their Treatment. J. L. Heffron. —p. 479.
128 Assay of Digitalis Preparations. M. S. Dooley.—p. 486.
129 Ocular Malingering. E. M. Alger.—p. 487.
130 Malingering from Standpoint of Ear. J. A. Robinson.—p. 492.

125. **Multiple Osteoma of Nasal Accessory Sinuses.**—Culbert cites a case of multiple eburnated osteoma involving the frontals, ethmoid, right orbit, middle and superior turbinates and cristi galli, and protruding into the cranial cavity. As this osteoma was so large and involved so many sinuses it was impossible to remove it as a whole, so that no exact size, shape, measurements, nor weight could be obtained; consequently, the size must be determined as far as possible by measurements of the shadows in the roentgenograms. In the frontal sinuses and the right orbit, this osteoma was one solid, continuous growth; but in the ethmoid region, it was composed of several nuggets, some of whose faces articulated perfectly. They resembled the tight overlapping of peanuts in a shell. In the operation, the result of this articulation was that when a part of one face was bitten off, the combination was unlocked with liberation of the remainder of that portion. These peculiarities of growth seem proof to the author that this multiple osteoma had several foci, which were, possibly, the frontal sinus, the junction of the frontal and ethmoid, the ethmoid, and the turbinates, and that all these different simultaneous growths were finally jammed and molded together. This growth covered a period of at least ten years. Although at necropsy an abscess was found in each frontal lobe, no sign or symptom referable to them had presented during the patient's life, with the possible exception of the last few days.

Ohio State Medical Journal, Columbus

December, 1918, **14**, No. 12

131 Treatment of Acne Vulgaris. A. Ravogli.—p. 687.
132 German Kaiser—A Psychological Analysis. H. H. Drysdale. —p. 689.
133 Physician's Place in War Time. B. R. Miller.—p. 694.
134 Fractures of the Aged. J. T. Haynes.—p. 698.

Pennsylvania Medical Journal, Athens

December, 1918, **22**, No. 3

135 Abduction Method of Treating Fracture of Neck of Femur. R. Whitman.—p. 112.
136 Acute Osteomyelitis in Children. A. C. Wood.—p. 118.
137 *Interpretation of Manifestations of Shock. C. C. Guthrie.—p. 123.
138 *Treatment of Surgical Shock in War Injuries. J. B. Roberts. —p. 126.
139 Some Theories of Shock. S. J. Meltzer.—p. 129.
140 Blood Pressure Question from Standpoint of General Practitioner. H. A. Hare.—p. 133.
141 *Results of Tests for Food Protein Sensitiveness in Small Group of Asthmatics. A. Sterling.—p. 135.
142 *One Hundred Cases Treated With Autogenous Vaccines. W. A. Womer.—p. 137.
143 Requisite Attributes of Properly Fitted Spectacles and Eye-Glasses. S. L. Olsho.—p. 140.
144 Bacteriologic Study of Deposition and Distribution, in Community, of Form of Micro-organism Previously Foreign to Community. A. T. McClintock.—p. 145.

137 and 138. Abstracted in THE JOURNAL, Nov. 9, 1918, p. 1607.

141. **Protein Sensitiveness.**—The reactions of twelve asthma patients were tested by Sterling to the following food proteins: Egg yolk, egg white, milk, casein, cheese, herring, beef, chicken, lamb, pork, wheat, rice, potato, barley, cocoa, radish, beet, cabbage, onion; also horse serum, and cat's hair, dog's hair, horse hair. Only one of these patients exhibited a positive reaction, a woman who showed erythema and a slight wheal, to pork, to cabbage, to rice and to radish. The patient's own statement corroborated the test thus far, that these foods always aggravated or brought on an asthmatic attack; but although she had excluded them from her diet for the last ten years, she is still subject to recurrences of asthma. The other asthmatics tested could not give a definite statement as to the effects of any particular food on their paroxysms. Six patients were benefited by subcutaneous injections of gradually increasing doses of foreign vegetable proteins.

142. **Value of Autogenous Vaccines.**—Womer used autogenous vaccines in 100 cases of arthritis, acne, abscesses, boils, carbuncles, endocarditis, eye and ear infections, infections of the hand, nasal sinuses, pyorrhea, respiratory conditions and urinary infections. Of these 100 cases 87 per cent. of the patients recovered completely, 13 per cent. did not. The most satisfactory results were obtained in infections of the skin and subcutaneous tissues. The results in respiratory conditions were not encouraging. All of the ear cases recovered except one, and this case was subsequently found by roentgen ray to have a very extensive involvement of the mastoid region. The improvement in many cases was very slow and the treatment was persisted in for many months.

Social Hygiene, New York

October, 1918, **4**, No. 4

145 Campaign Against Venereal Diseases in Its Ethical Aspects. L. Darwin.—p. 433.
146 Work With Chaplains in Army and Navy. W. A. Bradley.—p. 443.
147 An Efficient State Program Against Venereal Diseases. H. G. Irvine.—p. 453.
148 Act. No. 607. L. D. Childs.—p. 463.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

Dec. 7, 1918, **2**, No. 3023

1 *Bent Back of Soldiers. A. F. Hurst.—p. 621.
2 Rheumatoid Arthritis. T. P. S. Strangeways.—p. 623.
3 *Cause of Rickets. D. N. Paton, L. Findlay and A. Watson.—p. 625.
4 Vanghetti's Operation. W. F. Brook.—p. 626.
5 Hysterical Tremor. W. Johnson.—p. 627.
6 *Complement Deviation in Cases of Malaria. J. G. Thomson.—p. 628.

1. **Bent Back of Soldiers.**—Considerable experience with this condition has convinced Hurst that the bent back of soldiers, however variable its etiology, is constant in its pathology, being always hysterical in nature, and consequently always curable by psychotherapy. The most common cause is a blow in the back, either due to the explosion of a shell hurling a man against the side of a trench or causing the parapet to fall on him, or to some accident which might equally well have occurred in civil life, such as being jammed against a wall by a lorry. Occasionally an actual wound is present, but this is always superficial, the spine itself having escaped.

The one common factor in these various causes is pain, generally in the back, but occasionally in the abdomen, which is relieved by bending far forward. After a time the pain caused by the blow on the back, rheumatism or other exciting cause, diminishes or disappears. The patient can now often rest comfortably lying flat on his back, but he continues to stand or walk in the same bent position. The pain has gone, but the posture, adopted with the object of relieving it, remains. Numerous investigations with the roentgen rays have shown that there is no organic spinal lesion, even in those cases which follow a severe blow on the back. The appearance of the patient is so characteristic that the diagnosis is at once obvious, as there is no organic condition which in any way resembles it, except spondylitis deformans, which, however, never affects young men. Moreover, the position assumed in the latter is the same whether the patient lies down or stands, whereas the bent back of soldiers almost invariably disappears entirely, or almost entirely, on lying down. All forms of treatment except psychotherapy are useless.

3. **Cause of Rickets.**—The authors' experiments on dogs seemed to show that some other factor than diet is the prime cause of rickets in dogs, and they afford no evidence that milk fat (butter) contains any accessory factor protecting against the development of rickets. Pups kept in the country and freely exercised in the open air, although they had actually a smaller amount of milk fat than those kept in the laboratory, remained free of rickets, while the animals kept in the laboratory all became rickety.

6. **Complement Deviation in Cases of Malaria.**—A specific antigen for malaria has been prepared by Thomson from a culture of malaria parasites secured from as heavily infected a case as possible, according to the method described by J. G. and D. Thomson. The best antigen obtained by Thomson acted well diluted 1:30 with normal saline. The antigen must be titrated before use to estimate the minimum dose of complement required to use in the test. The patient's serum is diluted 1:10 with normal saline. Put up for each serum four tubes, three of which contain antigen, the fourth being the serum control. Into the three tubes containing antigen introduce two and a half, three, and three and a half doses of complement, and two and a half doses are added to the serum control. An antigen control is put up with each series. The method used is long fixation in the cold, the tests being kept over night in the ice chest. In the morning the sensitized red cells are introduced, and the results read after fifteen minutes in the water bath at 37 C. Thomson has performed tests on the serums of 200 known cases of benign and malignant tertian malaria, with or without parasites in the peripheral blood, and at all stages of treatment by quinin. After short courses of treatment the blood serum gives positive results, and in many cases he has obtained positive results, after a considerable amount of treatment; but the reaction tends usually to become weaker. After very prolonged treatment and in cases where there has been no attack of malaria for many months the blood serum usually gives a negative result. It is interesting to note that the serums of syphilitic patients give a positive result with this antigen, and it is necessary to exclude this disease.

Edinburgh Medical Journal

December, 1918, **21**, No. 6

7 Progress in Materia Medica. A. R. Cushny.—p. 317.
8 "No Splint" Treatment of Fractures About Shoulder in Humerus and About Elbow. J. W. Dowden.—p. 328.
9 First Steps in Laboratory Study of Patients. W. R. Logan.—p. 334.
10 Income Tax Information. J. Burns.—p. 341.
11 Training of Student of Medicine: Forensic Medicine. H. Littlejohn.—p. 346.
12 Id. General Practice. J. W. Crerar.—p. 350.
13 Id. D. E. Dickson.—p. 361.
14 Id. General Practice in Tropical and Sub-Tropical Countries. J. M. Dalziel.—p. 366.

Indian Medical Gazette, Calcutta

November, 1918, **53**, No. 11

15 War Surgery From Indian Troops War Hospital, Dehra Dun. N. Reader.—p. 401.
16 *Cases of Leprosy in Bangkok Main Prison Treated with Sodium Gynocardate and Sodium Gynocardate "A." M. Carthew.—p. 407.
17 Etiology of Sprue. L. Nicholls.—p. 409.
18 New Method of Standardization of Disinfectants. G. C. Chatterjee.—p. 414.
19 Roentgenography in An Indian General Hospital in Mesopotamia. J. D. Singh.—p. 417.

16. **Leprosy Treated by Gynocardates.**—Nine cases of the maculo-anesthetic form of leprosy and four cases of mixed leprosy were treated with sodium gynocardate A by Carthew. All lesions disappeared in two cases; very marked improvement occurred in three cases; considerable improvement occurred in six cases; improvement in one case and no improvement was noted in one case. Neither the duration nor the type of the disease seems to have any marked influence on the rapidity of the improvement. In Carthew's opinion, the relief granted to the patient by the improvement of his general health, together with the almost universal improvement of the symptoms of the disease, indicate that the treatment by sodium gynocardate A is indicated in all cases of leprosy of whatever type or duration.

Journal of Laryngology, Rhinology and Otology, London

November, 1918, **33**, No. 11

20 Reports for Years 1916 and 1917 from Ear and Throat Department of Royal Infirmary, Edinburgh. A. L. Turner, J. S. Fraser, and W. T. Garretson.—p. 323.
21 Histologic Changes Occurring at Site of Paraffin Injection. W. Wingrave.—p. 330.
22 Peculiar Neuro-Gastric Syndrome Cured by Submucous Resection of a Deflected Nasal Septum. J. B. Horgan.—p. 331.

Lancet, London

Dec. 7, 1918, **2**, No. 23

23 *Influence of Diet on Teeth Formation. M. Mellanby.—p. 767.
24 Treatment of Ante-Natal and Post-Natal Syphilis. J. Adams.—p. 770.
25 *Antiscorbutic Value of Raw Juices of Root Vegetables With View to Adoption as Adjunct to Dietary of Infants. H. Chick and M. Rhodes.—p. 774.
26 Hemorrhagic Bronchitis. H. Violle.—p. 775.
27 Local Anesthesia and Twilight Sleep in Surgery of Exophthalmic Goiter. S. H. Rouquette.—p. 776.
28 *Treatment of Extensive Septic Wounds. H. Gardiner.—p. 777

23. **Influence of Diet on Teeth Formation.**—The investigation made by Mellanby was undertaken primarily with the object of studying (1) the factors involved in the development of sound teeth and of the growth of the jaws in relation to the size of the teeth, and the factors bearing on the immunity of erupted teeth to caries and other diseases. The author discovered that hypoplasia of the teeth is caused largely by a deficient diet and that the factor in the diet which controls the calcification of the teeth is something of the nature of an accessory food factor (vitamin). This factor has a similar distribution to that of fat-soluble A, which is largely responsible for the calcification of bone, a deficiency of this substance in the diet being followed by the development of rickets. Puppies were used in this investigation. A diet containing in abundance those articles with which the fat-soluble A accessory food factor is associated, such as cod liver oil, butter, etc., allows the development in puppies of sound teeth. A diet otherwise adequate but deficient in the substances with which fat-soluble A is associated brings about the following defects in puppies' teeth: (a) delayed loss of deciduous teeth; (b) delayed eruption of the permanent dentition; in some cases the delay in the eruption of the permanent teeth is more marked than the delay in the loss of the deciduous teeth; (c) irregularity in position and overlapping especially of the incisors; (d) partial absence of or very defective enamel; (e) low calcium content; the deficiency in calcium salts may result in the teeth being so soft that they can be cut with a scalpel. The evidence makes it clear that this is an instance of diet affecting the teeth from the inside and is independent of bacterial sepsis and other oral conditions associated with food.

25. **Antiscorbutic Value of Root Vegetables.**—The results of the experimental work reported on here by Chick and Rhodes are strongly in support of those medical authorities who recommend the inclusion of some extra antiscorbutic in the diet of infants nourished on milk of which the original antiscorbutic value has been diminished by heating or drying. The experiments were made with young guinea-pigs. The juices were prepared by rubbing the clean-cut surface of the raw vegetable on an ordinary kitchen grater, placing the pulp in muslin and squeezing gently between the fingers. The juice was always prepared fresh every day. Expressed raw vegetable juices undergo changes rapidly at room temperature, and were found to deteriorate in respect of antiscorbutic value when stored even at a low temperature in a refrigerator. The raw juices of swede (turnip), carrot, and beetroot were used. The juice of the fresh raw swede (turnip) easily takes the first place in respect of antiscorbutic value. Protection from scurvy was attained with a daily ration of 2.5 c.c. In case of raw carrot juice, severe scurvy developed in animals receiving daily rations of 5 c.c. and 10 c.c.; with a daily ration of 20 c.c., protection from scurvy was secured and the general condition of the animals was about the same as of those receiving a daily ration of 2.5 c.c. swede (turnip) juice. In case of beet root, the antiscorbutic value was less than that of carrot; animals receiving a daily ration of 20 c.c. fresh raw juice showed only a small degree of protection, acute symptoms of scurvy supervened in every case, and several deaths from scurvy occurred before the period of experiment, three months, had expired.

28. **Treatment of Extensive Septic Wounds.**—Gardiner has been treating septic wounds with much discharge with no permanently applied dressing. The ordinary incisions for opening up recesses in pockets are made as soon as the patient has recovered from the result of transfer to the hos-

pital. Incisions and openings so made are performed with the idea of obtaining the maximum effect of gravity in the subsequent treatment. The wound is then packed with gauze and bandaged in the usual way, the sole object in this being to assist in stopping oozing of blood. All dressings are removed forty-eight hours later. The wound is then syringed with some mild antiseptic, for example, boric or weak eusol lotion. A guard made from perforated zinc, cut in an appropriate size and bent in the form of a cradle, is placed over the limb or part wounded and covered by a sterilized towel. If possible, an ordinary cradle is placed over the whole. Any discharge from the wound is allowed to run out from the wound, and is taken up by a sterile pad of wool of sphagnum moss so placed as not to touch the wound. At intervals varying with the amount of discharge, on an average twice a day, or in some cases more frequently, the nurse lifts the towel and zinc guard, syringes or swabs the wound, and changes the pad. The guard and towel are then replaced. This treatment is continued until all pockets and recesses have been closed by granulation, the granulating surface is smooth, and the discharge has practically ceased. The wound is then dressed in the ordinary way with gauze and wool. Forty or fifty cases have been treated in this way, and in none of them have any bad effects been observed as the result of leaving the wounds open. In some of these the wounds were so extensive, and the discharge so foul and profuse, that amputation on admission was seriously considered. Wounds infected with a great variety of organisms —all those commonly met with in such wounds—have been treated in this way with success.

Medical Journal of Australia, Sydney

Nov. 23, 1918, **2,** No. 21

29 Emergency Surgery. A. S. M. Tymms.—p. 425.
30 Case of Urethrectomy H. Bulloch.—p. 429.
31 Congenital Absence of Left Lung. A. H. Tebbutt.—p. 430.
32 Persistent Thymus in Exophthalmic Goiter. A. H. Tebbutt.—p. 430.
33 Polyuria in Some Cases of Medullary Hypernephroma. W. F. Litchfield.—p. 431.

Practitioner, London

December, 1918, **101,** No. 6

34 Cardiac Bruits. T. Horder.—p. 301.
35 Sanatorium Treatment of Pulmonary Tuberculosis. G. B. Dixon. —p. 308.
36 *Treatment of Sepsis by Zinc Ionization. A. R. Friel.—p. 315.
37 Massage and Electrotherapeutic Work at a War Hospital. N. Morris.—p. 324.
38 Recent Advances in Dental Surgery. F. N. Doubleday.—p. 331.
39 Fracture of Cervical Vertebra: After-Treatment by Mechano-Therapeutics. E. F. Cyriax.—p. 337.
40 Essential Features of Successful Maternity and Child Welfare Scheme for Smaller Towns. R. H. Deans.—p. 341.
41 *Treatment of Malaria. J. H. K. Sykes.—p. 346.
42 Foreign Body (A Living Fish) in Pharynx. M. Z. Shafei.—p. 348.

36. **Treatment of Sepsis by Ionization.**—Treatment of sepsis by zinc ionization consists in the introduction of zinc into the septic area by means of the electric current. The solution of zinc sulphate ordinarily used contains: zinc sulphate, 0.25 gm.; alcohol, 0.75 c.c.; water, to 100 c.c. But when it is desired to have the solution viscid, so that, for example, it may adhere to a sloping surface, gelatin is an ingredient: zinc sulphate, 2 gm.; gelatin, 15 gm.; water, to 100 c.c. Friel has found that ionization with zinc is successful in middle-ear suppuration, empyema of the maxillary, of the frontal, and of the sphenoidal sinuses; impetigo of the face, eczema, ulcers of the arms or legs; some wounds.

41. **Treatment of Malaria.**—Sykes is in favor of the large dose of quinin given in solution. The cases in which the best results were obtained were treated as follows: First week, 20 grains of quinin sulphate were given daily, four hours before the expected attack. Second week, the dose of quinin was reduced to 17.5 grains. Third week, the dose of quinin was reduced to 15 grains. The patients were kept in bed the first week; allowed up half day the second week, and all day the third week, with physical exercises and route marches. All the cases were of old standing, the duration of the disease varying from eight months to two years and eight months, and they were all cases of undoubted malaria Relapses have occurred in only 25 per cent.

Tropical Medicine and Hygiene, London

Dec. 2, 1918, **21,** No. 23

43 Enterica in Sudan. R. G. Archibald.—p. 229.

Archives de Médecine des Enfants, Paris

October, 1918, **21,** No. 10

44 Endocrinous Glands and Bone Dystrophy. V. Hutinel.—p. 505.
45 *Zinc Treatment of Cold Abscess. C. H. Sztark.—p. 546.

45. **Zinc Treatment of Cold Abscess.**—Sztark has found exceptionally effectual the application of a sheet of zinc, the thinnest possible, cut to fit the shape of the lesion and applied directly to it. He explains its action as the result of the ions generated by the different nascent compounds of zinc. The metal is held in place with a dressing which is left undisturbed for five or seven days. Any tendency to hypertrophy of the edges of the lesion calls for cauterization. He reports that long rebellious cold abscesses yielded promptly to this treatment.

Bulletin de l'Académie de Médecine, Paris

Nov. 19, 1918, **80,** No. 46

46 *Grafts of Dead Tendons. Delorme.—p. 452.
47 Renal Forms of Influenza. R. Dalimier.—p. 456.
48 Mechanism of Prostatic Retention of Urine. F. Legueu.—p. 458.

46. **Grafts of Dead Tendons.**—THE JOURNAL mentioned recently in these columns, page 149, the results obtained in a hand that had had six strips of dog tendons introduced to bridge extensive gaps in the tendons. Fine functional results were realized. Delorme has reexamined the man recently and found that practically the complete use of the hand had been regained, the dead animal tendons, which had been kept in alcohol for a month, acting like normal natural tendons. He urges the application of this technic on a large scale to aid men who have lost the use of one or more fingers from destruction of tendon substance.

Bulletins de la Société Médicale des Hôpitaux, Paris

Oct. 18, 1918, **42,** No. 29

49 *Influenza. Florand.—p. 949; Caussade.—p. 954; Rénon and Mignot. —p. 958.
50 *Pfeiffer's Bacillus in Influenza. Orticoni and Barbié.—p. 959.
51 Form of Colloidal Gold in Influenza. A. de Verbizier.—p. 961.
52 Symmetrical Tumors on Fingers. L. Giroux.—p. 963.
53 Follicular Psorospermosis. L. Giroux and Miriel.—p. 966.
54 *Malaria and Wassermann Reaction. Aimé and Lochelongue.—p. 968.

49. **Influenza.**—Florand's experience with 500 cases has convinced him that one attack usually confers immunity after complete recovery. The rarity of otitis, sinusitis and mastoiditis is noticeable, as also the almost constant tendency to hemorrhages. Spirochetes are frequently found in the sputum, but no one ascribes pathogenic importance to them. Netter thinks that plain serum would probably be as effectual as the antiserums that are being used, and if plain beef serum were used, it would ward off any tendency to anaphylaxis later. Caussade comments on the toxemia with influenza, saying that all treatment will fail until we definitely identify the pathogenic agent of the disease and institute specific serotherapy. The only rational treatment to date, he reiterates, is with antipneumococcus serum in the cases in which the pneumococcus is involved.

50. **Pfeiffer's Bacillus in Influenza.**—This report states that the influenza bacillus was cultivated from the blood, the pleural fluid or the cerebrospinal fluid in 58 per cent. of ninety cases. About 200 c.c. of glucosed bouillon is inoculated with 10 or 15 c.c. of blood taken from a vein of a patient with temperature of 102 or 104 F. Other germs add their action, but the Pfeiffer bacillus seems the pioneer. But it may be merely the pioneer of the second invasion, the first being by a still unknown germ.

54. **The Wassermann Reaction in Malaria.**—Aimé warns that a positive Bordet-Wassermann reaction should not be accepted as necessarily a sign of syphilis unless malaria, possibly atypical, can be excluded. In case of doubt, give quinin and watch the response then to the Wassermann test.

Lyon Médical

November, 1918, **127**, No. 11

55 *Treatment of Artificial Anus. J. Guérin.—p. 481.
56 *Pericardial Friction Sounds. J. de Teyssier.—p. 499.
57 Mosquitoes and Old Foci of Malaria in the Mountainous Regions of Southeastern France. L. Léger and G. Mouriquand.—p. 524.

55. **Artificial Anus.**—Guérin reviews the experiences in Delore's service with eighteen cases of a stercoral fistula or artificial anus. In nine of the cases lateral enterorrhaphy answered the purpose perfectly, the patients being all completely cured of their abnormal anus in less than a month. In the other cases enterectomy was required and proved equally successful. The dangers of this operation have been exaggerated, he emphasizes; it always proceeded smoothly in the cases reported. The only case in either series in which an attempt was made to operate extraperitoneally, proved a failure, and the intraperitoneal technic had to be applied after all. The eighteen cases are described in full, with the details of the technic.

56. **Propagation of Pericardium Friction Sounds.**—As a rule, the pericardium friction sounds do not spread. But occasionally, with the pericarditis of Bright's disease, the friction sounds are heard at a distance and two cases are on record in which it occurred with rheumatismal pericarditis. Teissier here reports a case in which the friction sounds were heard over a remarkably large area, and necropsy showed all the organs in the thorax soldered together from tuberculous pericarditis.

Paris Médical

Nov. 9, 1918, **8**, No. 45

58 Auscultation of the Tuberculous. C. Sabourin.—p. 357.
59 Pelvic-Trochanter Paralysis After Intragluteal Injections of Quinin. J. A. Sicard and H. Roger.—p. 366.
60 Roentgen Localization of Projectiles. J. Guyot, J. Masson and R. Chachignot.—p. 368.

Presse Médicale, Paris

Nov. 25, 1918, **26**, No. 65

61 *Septicemias. P. Govaerts.—p. 597.
62 *Blood Pressure in Malaria. E. Jeanselme and R. Dalimier.—p. 599.
63 Fracture of Ascending Ramus of Lower Jaw; Diagnosis and Treatment. L. Imbert and P. Réal.—p. 601.
64 Edema with Liver Disease. Editorial.—p. 603.
65 *Disinfection of Cavities. J. Silhol.—p. 604.

61. **Significance of Septicemia.**—Govaerts remarks that Bull has thrown much light on the nature of septicemia by his discovery that certain bacteria become agglutinated at once when injected into the blood of an experimental animal, and the bacteria disappear from the blood. The outcome of the infection thus depends on whether or not the animal's blood has a natural or acquired agglutinating property, as the bacteria, once agglutinated, become rapidly incorporated by the phagocytes. Govaerts has continued research in this line and here announces that the phenomenon is not actual agglutination, such as we see in the test tube, the bacteria sticking together. In the animal's blood, on the other hand, the bacteria become involved in a mass of blood platelets which solders them into a more or less solid mass without the bacteria themselves sticking together—there are always interposed platelets between them. This action of the platelets is elective, he adds, because when an emulsion of staphylococci and of pneumococci, mixed, is injected into the blood, the platelets pick out and solder the pneumococci while the staphylococci are left floating free in the blood. The agglomerated masses are arrested in the capillaries and they rapidly disappear, the bacteria vanishing as they are phagocyted. He is unable to state positively the fate of the platelets involved. If virulent pneumococci are injected into the blood of a rabbit, they do not become agglutinated in this way but keep on floating free in the blood stream. The same pneumococci, injected into the dog, rapidly mix with the blood platelets and become agglomerated in masses, vanishing from the blood stream. His research suggests that a phagocytic action must be attributed to the platelets, and that the ability to induce septicemia is not a question of the virulence or nonvirulence of a strain of bacteria but is a matter of their stability in the blood stream, their power of resistance to the agglomerating force of the platelets. The intensity of the septicemia depends, of course, on the power of the bacteria floating free in the stream to multiply. This power is possessed in high degree by the streptococcus, to a lesser extent by the staphylococcus, and by the perfringens or gas bacilius. Resistance to agglutination, resistance to phagocytosis, and aptitude for inducing septicemia seem to be all three the result of some special physical condition of the surface of the microbe.

This brings up the new question why at a given moment the bacteria of a hitherto localized infection suddenly acquire properties which permit them then to escape agglutination and circulate freely in the blood stream. This brings the question how to modify the surface of the microbe floating freely in the blood stream so that it will stick to the platelets and become agglomerated in masses of them. It seems logical to try to accomplish this by injection of an agglutinating serum; this might be tried in typhoid septicemia. In surgical septicemia the difficulty would be to obtain an agglutinating serum that would act on the different strains of streptococci, etc., involved. It is by an analogous action that Hooker's success with transfusion of immunized blood can be explained. The donor is first vaccinated by means of a microbe cultivated from the blood of the septicemia patient. It is evidently by some modification of the surface conditions of the microbes in the blood stream that the colloidal metals, foreign proteins, etc., exert their influence in treatment of septicemia. It has been noticed that all these diverse substances that have proved more or less effectual in treatment of septicemia, cause agglomeration of the platelets. The chemical composition of the substance injected into the blood seems of less import than its physical properties, but hitherto this phase of the subject has not been studied. As the mechanism of their action has not been understood before, it was impossible to select them with intelligence or gage their efficacy beforehand.

62. **The Blood Pressure in Secondary Malaria.**—The maximal arterial tension in ordinary malaria past the acute phase keeps at a certain level all the time, but the minimal tension varies within a remarkably wide range with every attack. This shows that the myocardium is clinically sound while the vascular tension fluctuates to a remarkable extent. The discovery of a drop in the maximal tension thus should warn that the malaria is passing into a pernicious phase or the heart is showing signs of weakening. The suprarenals seem to suffer during the malarial attack, and this may be the explanation of the upset in the vascular tension, the suprarenals either functioning to excess or becoming insufficient.

65. **Disinfection of Cavities in War and Peace.**—Silhol remarks that he used to rinse out the pleura but usually had deplorable results. The war has shown that the principle is correct but that it must be applied with infinite attention to details. This makes it a life-saving and promptly effectual measure. The same can be said of irrigating the infected uterus. In a recent case the puerperal uterus was profoundly infected, the cervix soft, the young woman's general condition grave, but there was no albumin in the urine, and Silhol had Carrel's method of irrigation applied to the uterus by a nurse skilled in the technic. The temperature began to go down by the next day and in four was normal. Contrary to his advice, the Carrel irrigation was suspended as soon as the acute phase was past, and a few weeks later symptoms of salpingitis became apparent. He is convinced that Carrel treatment kept up long enough would ward off infectious processes in the adnexa, especially when begun early. The lessons learned in war surgery in regard to disinfection of cavities should be applied in civilian practice without delay.

Progrès Médical, Paris

June 15, 1918, **33**, No. 24

66 *Suprarenal Insufficiency in the Troops. Satre and Gros.—p. 205.
67 Walking After Wounds of Legs. H. P. Achard.—p. 209.
68 Blanching of Hair after Skull Wound. J. Chalier.—p. 210.

June 22, 1918, **33**, No. 25

69 *Primary Poliomesocephalitis. Saint-Martin and Lhermitte.—p. 213.
70 Treatment of War Wounds. G. Louvard.—p. 215.
71 Femoral Arteriovenous Aneurysm. M. Haller.—p. 217.

66. **War Suprarenal Insufficiency.**—Satre and Gros give a number of examples of what they call war hypoepinephric

syndromes. Supplying the lacking epinephrin cured the disturbances when they took the form of a diarrhea resembling cholera, as also in grave gastro-intestinal toxic infections. The men thus affected had led a sedentary life before the war, and the functioning of their damaged suprarenals had sufficed for their regular indoor life, but under the stress of campaigning the insufficiency of their endocrine system soon made itself manifest. The symptoms reveal the inability of the antitoxic functions to cope with the excessive amounts of poisons generated by the waste from muscular work. Whether there is merely functional suprarenal upset or organic damage, the fundamental symptoms are the same, vomiting, dizziness, asthenia and hypotension—just as in seasickness. There may be also small brownish spots on the skin, symmetrically distributed. When the solar plexus is irritated, there are liable to be apoplectiform coma or pseudomeningitic symptoms, vasomotor disturbances, etc. The blood pressure is low in all the forms. Arsenic, mercury and iodid are violent poisons for the suprarenals; nicotin is also injurious for them. Large and fractioned doses of epinephrin are called for, with ingestion of the total extract of the suprarenals. The epinephrin and extract of the capsule have a tonic and cardiovascular action, remarkably effectual, promptly raising the blood pressure and acting energetically to promote diuresis. If the epinephrin can be given by the mouth, from 8 to 10 mg. can be taken during the twenty-four hours, fractioned and well distributed. It should never be given in syrup, but the drops should be counted into sweetened water just as the dose is to be taken. The digestive intolerance usually makes it necessary to give the epinephrin by intramuscular injection.

69. **Poliomesocephalitis.**—This term is used to express what Netter and others call lethargic encephalitis. Two absolutely typical cases are described; high fever, narcolepsy and ptosis are the main features of the disease.

Revue Médicale de la Suisse Romande, Geneva

November, 1918, **38**, No. 11

72 *Influenza. N. Betchov.—p. 625; J. Minkine.—p. 634.
73 *Poisoning from Barbital. P. Gautier.—p. 641.
74 Influenzal Albuminuria in Children A. D'Espine.—p. 647.
75 Ileus from Cherry Stones. Mauclaire.—p. 651.

72. **Influenza.**—Betchov expatiates on the characteristic fever curve in influenza, with its two high peaks at a two or three day interval, and the exacerbation of symptoms which parallel these double peaks. He thinks that this double course is explained best by the assumption of a multiple virus, twofold at least. The first virus must be a filtrable inframicroscopic substance which traverses countries with a rapidity without an equal in the annals of epidemiology. The second peak is the work of ordinary germs, especially the pneumococcus, which follow in the wake of the first virus. The incubation was exactly two days in his experience, and contagion seemed to occur only during the early catarrhal phase, before the subject felt that he was really sick. He is inclined to regard the characteristic pain in the spine region as the result of congestion and hyperfunctioning of the suprarenals. Minkine declares that influenza always confers a relative and usually a permanent immunity. It never exists in epidemic form in a country with rapid and multiple means of communication, and he insists further that it is possible to arrest an epidemic. A mask or handkerchief covering mouth and nose while in the room with the sick is effectual protection if the hands are washed often.

He exclaims that if a man does not open his umbrella until he has walked several minutes in a shower, the fact that he is wet does not prove that the umbrella does not protect against the rain. Contagion is always by direct immediate contact with some one with influenza. In spite of extensive investigation, he has been unable to discover an instance of transmission of the disease by fomites. The pandemics are due to the fact that influenza is transmitted only slowly from place to place in remote regions with rare and slow means of communication. When it reaches railroads and other rapid means of communication, and the virulence of the virus becomes enhanced by repeated passages through human beings, it spreads more and more rapidly and with greater virulence. The concentration of men in camps this year provided exceptionally favorable conditions for its rapid and universal spread, as a new generation had arisen unprotected by immunity. The human race would die out, he remarks, if there were even one pandemic which did not confer at least a transient immunity. Epidemic influenza exists in sporadic form in the unpeopled regions of Turkestan and perhaps in the heart of Africa.

He says that the influenza virus does not exist in an active phase in the external world; this assumption is based on the single but well established fact that in every case direct contagion can be demonstrated if sought with enough care. The persons to tend influenza patients should be selected among those who have had the disease. They will not contract or spread it. All gatherings in enclosed places should be forbidden, and the cafés in particular closed, and persons obliged to work in common should be compelled to wear a mask. These precautionary measures need not be kept up long; a period of two weeks is ample. Draconian measures applied for a short period are effectual; half-way measures, even long kept up, are of no use whatever. Both Betchov and Minkine have had practical illustration of the principles they advocate as the isolated sanatoriums of Switzerland provided conditions as in a laboratory experiment.

73. **Barbital Poisoning.**—Gautier reports four cases of self-drugging or attempt at suicide in which 3.5, 5, 7 or 8 gm. of diethyl malonyl urea had been taken. One woman of 33 died after four days of coma and hyperpyrexia; the dose had been only 5 gm. Necropsy revealed nothing but congestion of the brain and the bases of both lungs. Those taking this drug habitually seem less able to stand moderate doses than others. Death has occurred from a 3 gm. dose in the addicts while recoveries are known after a single dose of 10 gm. Treatment can be only symptomatic. Gautier protests against the unrestricted sale of barbital, particularly as it is liable to lead to morphin addiction.

Policlinico, Rome

Nov. 17, 1918, **25**, No. 46

76 *Epidemic Meningitis. E. Brignone.—p. 1105.
77 Pericardium As Obstacle to Projectile. C. Guarini.—p. 1110.
78 Action of Formaldehyd on Tubercle Bacilli. F. Durand.—p. 1112.
79 The Medical Reserve Corps of the Future. G. Ruggi.—p. 1114.

November, 1918, **25**, Medical Section No. 11

80 *Recklinghausen's Disease. A. Roccavilla.—p. 321.
81 *Nitrobenzene Poisoning. P. Zuccola.—p. 341.
82 *Antitetanus Serum Neutralizes Strychnin. A. Londini.—p. 351.

76. **Epidemic Meningitis.**—Brignone emphasizes that with large and repeated doses of antimeningococcus serum and isolation of the sick and contacts the physician even in the remotest village can feel that he has no cause to dread epidemic meningitis more than any other disease, and that he can defend his patients against it. As a rule, he says, a polyvalent antiserum should be given the preference. The room should be disinfected, and for this he advises calcimining the walls; a hot 10 per cent. solution of soda for the floors, and the steam sterilizer—the autoclave—for the clothing and bedding, or else boiling. The contacts should be relatively isolated for two or three weeks, and the throat and nose examined every day and the tonsils painted with a 3 per cent. iodized glycerin with antiseptic gargles, and the nose douched with potassium permanganate and a mentholated salve applied inside the nose. These measures should be supplemented by a subcutaneous injection of 20 c.c. of antimeningococcus serum as a preventive given to those most exposed to contagion. Preventive vaccination is said to confer durable immunity, but he does not seem to have had personal experience with it. The curative dose of the antiserum ranges from 30 to 50 c.c. for intraspinal injection after withdrawal of spinal fluid in amounts a little more than the serum injected. The dose for infants is from 10 to 20 c.c. He has lost only two of his thirteen patients and these were in the last stages of the disease when the physician was first summoned. When the serotherapy was begun by the second day, the prompt turn for the better was constant.

80. **Neurofibromatosis.**—Roccavilla gives a minute description of two cases of Recklinghausen's disease, both in sol-

diers. He tabulates the metabolic findings and appends the biography of the last five years. There was nothing to suggest toxic action in the antecedents, no tuberculosis, syphilis, or other severe infectious disease, but the data presented seem to justify the conception of the endocrine-sympathetic nature of neurofibromatosis.

81. **Nitrobenzene Poisoning.**—Zuccola reports that a woman of 41 drank by mistake one morning, fasting, 30 c.c. of nitrobenzene (oil of mirbane). Emetics were administered in a few minutes after the first symptoms and she vomited, and in three quarters of an hour the stomach was profusely rinsed out and stimulants were injected. At the end of an hour and a half the woman sank into coma. The poison displayed a most rapid and intense destructive action on the blood, but this was followed by extremely active regeneration of the blood. Bone marrow obtained by trephining a rib and the tibia showed intense hyperactivity. Animals experimentally poisoned with nitrobenzene did not show any changes in the blood remotely resembling those in his patient, whose capacity for reaction was remarkable. At first the tint of the face was blackish, the subcutaneous veins looked like black stripes, and the limbs were contracted, with jerky movements, trismus and opisthotonos; the pupil reflexes were abolished as well as control of the sphincters. Blood from the finger looked black, and the reds did not form coin rolls. About 400 c.c. of defibrinated blood were injected into a vein after a few hours, and marked improvement followed. The transfusion was repeated two days later and the woman was discharged in good condition the fortieth day. The blood findings from day to day are recorded. The anisocytosis was most impressive. Some of the reds measured 14 and even 16 microns, while others measured only 2. The dark tint of the skin persisted for nearly two months. The blood findings and the clinical course resembled those in Pollak's case of acute copper sulphate poisoning.

82. **Power of Antitetanus Serum to Annul Toxic Action of Strychnin.**—This property of antitetanus serum has proved useful in standardizing the serum. Londini here presents evidence to show that this property is dependent on the cholesterol content of the antiserum. With cholesterol alone, the toxic action of strychnin can be annulled. The antistrychnin action seems to be proportional to the cholesterol content of the antiserum, but does not seem to have any connection with the antitoxic property of the antiserum.

Riforma Medica, Naples

Nov. 9, 1918, **34**, No. 45

83 *Mechanism of Action of Chloroform. V. Aloi.—p. 890.
84 *Mercuric Chlorid in Influenza. G. Ferrarini.—p. 893.
85 Postdiphtheric Stenosis of Larynx and Trachea. D. Tanturri.—p. 894.
86 Referendum on Influenza. Centanni and others.—p. 896.

83. **Action of Chloroform.**—Aloi reports research the results of which seem to confirm the increase in the urea, ammonia and total nitrogen in the urine after chloroform anesthesia. In small doses, no appreciable anatomic damage results, but with prolonged administration and large doses, grave changes develop in the organs, an actual fatty degeneration, mainly in the heart, the liver, the kidneys. Diabetes induces lesions analogous to those from chloroform, a clinical picture resulting under chloroform which resembles the acidosis of diabetes. He was able to determine directly the presence of beta-oxybutyric acid in the urine, in eleven cases described, as the immediate result of inhalation of chloroform. In one case of the kind, 25 gm. of choloroform had been used in a hemorrhoid operation, and afterward the total nitrogen rose to 18.732 per thousand, with beta-oxybutyric acid, but no acetone. In most of the other cases there was abundant acetone for a time.

84. **Intravenous Injection of Mercuric Chlorid in Treatment of Influenza.**—Ferrarini advocates in grave cases of influenza a daily intravenous injection of 0.01 gm. mercuric chlorid dissolved in 1 c.c. of physiologic saline. This gave such good results in his experience with hundreds of cases that he has abandoned all other measures except heart tonics when needed. He has never had any untoward by-effects with these large doses, and even grave albuminuria does not contraindicate this treatment; it improves instead of growing worse under it. He begins this treatment at the first sign of congestion of the lung, but even at the fifth or seventh day it proved effectual in a large number of cases, patients recovering under it who previously had seemed doomed.

Medicina Ibera, Madrid

Aug. 3, 1918, **4**, No. 39

87 The Cells of the Mesenchyma. C. Calleja.—p. 105.
88 Case of Acromegaly. A. Torres y Lopez.—p. 109.

Aug. 10, 1918, **4**, No. 40

89 *Reconstruction of Eyelid. Soria y Escudero.—p. 129.
90 *Mercuric Chlorid in Puerperal Fever. J. A. Pérez.—p. 130.
91 *Stenosis of Esophagus. A. Torres y Lopez.—p. 133.

89. **Reconstruction of Eyelid.**—Soria cut a long flap of skin extending down below the ear, according to Snydacker's technic, and twisted it around to make the new eyelid. The lid had been destroyed by a malignant pustule at the age of 14. It had been treated with the actual cautery and the retraction of the tissues left the eyeball exposed. The photographs show the apparently complete success of the blepharoplastics.

90. **Mercurial Treatment of Puerperal Septicemia.**—Pérez relates that he gives intravenous injections of a 1 per thousand solution of mercuric chlorid in treatment of puerperal septicemia. He has thus treated 200 patients, giving 2 c.c. the first day, half in the morning and half at night; the second day 4 c.c., fractioned, and so on up to 10 c.c. the fifth day, continuing with this dose, until the fever drops, then keeping on with half the dose. The curative effect is most pronounced in the cases of pure septicemia. In the fulminating cases the organism does not have time to react, and these injections are contraindicated, as also in pyemia. No by-effects of any importance were observed in any instance, while recovery occurred under this treatment in large numbers of otherwise apparently hopeless cases. Physiologic serum is specified as the vehicle.

91. **Stenosis of Esophagus.**—Torres comments on the remarkable prevalence of esophagus disturbances in his district (Granada). In a recent eight months there were thirty-one cases of stenosis at the clinic or in his private practice, and he here gives the details of this series. The roentgen rays show a large diverticulum in some. Most of the patients were men from 40 to 60 but one was a young man of 18. In all, the disturbances had come on gradually after symptoms on the part of the stomach for a long time, and in several cases other members of the family had likewise had stomach and esophagus trouble. In only one of the total thirty-one cases was the stenosis the result of drinking a caustic; this was a girl of 5 who had drunk hydrochloric acid five months before. No mention is made of the treatment in any case.

Prensa Medica Argentina, Buenos Aires

Oct. 20, 1918, **5**, No. 14

92 *Drainage and Irrigation of the Peritoneum. R. Finochietto.—p. 137.
93 Malformations of Uterus from Obstetric Standpoint. M. L. Perez.—p. 138. To be continued.
94 Obstetric Puericulture. M. Acuña.—p. 140.
95 *Protection of Duodenal Stump. N. Tagliavacche.—p. 145.

92. **Drainage of the Peritoneum.**—Finochietto gives five illustrations to show the different types of drainage required for various abdominal processes, and urges a combination of aspiration and intermittent irrigation as particularly useful in certain conditions. The aid of gravity must be utilized to the utmost, as he shows in detail. It may be necessary to drain the recesses of the mesentery, and for this he passes two tubes through from one flank to the other, passing one through a hole in the mesentery near the spine. One tube is for the irrigation, the other for the draining.

95. **To Protect Stump of Duodenum.**—Tagliavacche refers to the stump left after pylorectomy when the benign lesions in the anterior portion of the pylorus and duodenum do not involve the posterior portion of the initial segment of the duodenum. When the pyloric segment of the stomach is cut off, he turns it back on itself like a barn door which brings into view the peritonized posterior aspect of this pyloric segment. He cuts a flap in the peritoneum at this point, its

hinge portion on a level with the duodenum and pancreas. After resection of the pylorus, this flap is used to make a staunch covering for the duodenal stump, with a special triple row of sutures, as he shows in six illustrations of this *peritoneo-duodenoplastia*, as he calls it.

Revista del Instituto Bacteriologico, Buenos Aires

August, 1918, **1**, No. 4

96 *Bovine Serum in Prevention of Serum Sickness. J. Penna, R. Kraus and J. B. Cuenca.—p. 405.
97 *Treatment of Whooping Cough. M. I. Barilari.—p. 421.
98 *Production of Antitoxic Serums. A. Sordelli.—p. 427.
99 *Race and Family in Transmission of Cancer. A. H. Roffo.—p. 445.
100 *Vaccination against Anthrax. H. J. Rossello.—p. 449.
101 *Snake Venoms. B. A. Houssay and J. Negrete.—p. 453; Id.—p. 461.
102 *Research on Anaphylatoxins. G. Fischer and L. Kantor.—p. 471.
103 Microfilaria in Blood of Bird. R. Biglieri.—p. 481.

96. **Prophylaxis of Serum Sickness with Beef Serum.**—Penna, Cuenca and Kraus have found that beef serum injected before or with horse serum seems to neutralize the tendency of the latter to induce serum sickness. They describe the various efforts that have been made to ward off phenomena of anaphylaxis, and relate that the Besredka method of preliminary injection of a very small dose, a few hours before the main injection, has proved almost invariably effectual in animals, but it fails occasionally in the human, as they have experienced again and again with diphtheria antitoxin and tetanus antiserum. No method to date has fulfilled the anticipations of its discoverer, so that the problem of prophylaxis of serum sickness is still clamoring for solution. In their extensive experience with normal beef serum in treatment of anthrax, they became convinced that beef serum may solve the problem. Their success in reducing the mortality of anthrax to a lower figure than ever before recorded, using plain normal beef serum in treatment, was accompanied by a notable reduction in the proportion of cases in which serum sickness developed, notwithstanding the large doses of normal beef serum injected. Further experiments with cattle have demonstrated that potent diphtheria antitoxin and antitetanus serum could be obtained with beef serum as well as with horse serum. With these antiserums there need be no fear of anaphylaxis on suspicion of a preceding serotherapy. By using beef antiserum, all danger is averted. Some recent experiences at the Children's Hospital have confirmed that serum sickness occurs only exceptionally (2.1 per cent. in 290 cases of anthrax; 0 in 40 cases of typhoid), when beef serum is injected, normal serum or as a diphtheria or tetanus antiserum. Given in equal quantities or at least over a third, with horse antiserums, it materially reduces the tendency to serum sickness (12.7 per cent. in 33 cases of typhoid or anthrax).

97. **Treatment of Whooping Cough.**—Barilari reports attempts at treatment of whooping cough with the patient's own sputum, or with asthma sputum, with an autovaccine, with sputum from healthy persons, and with various preparations. Charts are given showing the abrupt drop in the number of paroxysms after injection of an autovaccine or a preparation made from the patient's sputum. The latter is generally called Kraus' antitosina. One young man with violent paroxysms and vomiting, the tenth day of the disease, was improved by a single injection of autovaccine, no vomiting occurring thereafter. The second injection two days later was followed by a drop from twenty to eight paroxysms a day, all immeasurably milder, in less than a week. A young woman with whooping cough for a month was given two injections of 5 c.c. of a preparation from whooping cough sputum, and in a week the paroxysms had dropped from twenty-eight to nine, much less severe. No effect was apparent in some cases, but, on the whole, Barilari extols this antitosina method as efficient. The sputum for the antitosina must be from persons who have not previously been treated with it. The cough loosens up and becomes less spasmodic, and vomiting ceases. Thirteen charts are given; they demonstrate the superior efficacy of this whooping cough sputum therapy, at least over the other substances tested.

98. **Production of Antitoxic Serums.**—THE JOURNAL has previously mentioned (May 11, 1918, p. 1406), the success of Kraus and Sordelli in producing in a remarkably short time an exceptionally potent diphtheria antitoxin by injecting a neutralized mixture of diphtheria toxin and antitoxin, nonfatal for guinea-pigs. Sordelli here reports further experiences in this line which have confirmed the previous statements. In both old and young horses an antitoxin was obtained in two months far surpassing what could be obtained by the usual toxin method of immunization in five months. In one horse, an antitoxin potency of 1,200 units was obtained in two months, in two others, of 220 and 450 units. These three horses were under 5. With the older ones a potency of 700, 600, 180 units was obtained in about two months. Antitetanus serum was obtained in the same way by immunizing the horses with a mixture of tetanus toxin and antitetanus serum. The results were quite favorable, a potency of 150 and 250 units being realized in four or five months such as usually takes eight months to realize. More striking results were obtained when, instead of this, the horses were treated with tetanus toxin the toxicity of which had been annulled by addition of formaldehyd, 1.5 per thousand of the 40 per cent. solution. This toxoid proved nonfatal for guinea-pigs after a few days of contact, none of the animals dying by the eleventh day of contact when injected with 3 or 5 c.c. The antitoxic potency of the serum of horses immunized with this toxoid surpassed anything hitherto known in this line, two horses reaching 1,500 units in six or seven months, although they were 14 and 15 years old and were in poor condition at the start. Good results were obtained also with horses that had been previously immunized with the pure toxin.

99. **Race and Family in Transmission of Cancers.**—Roffo reports several series of experiments with transmission of cancers in white rats, one series alone using 1,150 animals. By interbreeding with the common black rat, and other experiments, he was impressed with the constant predominance of the mendelian laws of heredity as manifested in susceptibility to inoculated cancers. A difference in race and family, even a change to another environment, modifies the receptivity.

100. **Vaccination Against Anthrax.**—Rossello describes an antianthrax vaccine now made in Uruguay. It is a uniform emulsion of a certain number of free spores, and confers a more durable immunity than vaccines made from the bacteria themselves.

101. **Research on Snake Venoms.**—The diastasic properties of the organs of the *Lachesis alternatus* were investigated by Houssay and Negrete, as here reported. Another, their fourth communication on snake venoms is devoted to some Australian and East Indian snakes.

102. **Anaphylatoxins.**—The results of experiments on one species of animals cannot be applied to other species or to man without discrimination. The researches here reported confirm this fact anew, showing how a bacterial anaphylatoxin prepared with guinea-pig or rat serum is extremely toxic for guinea-pigs but not for rats and rabbits. On the other hand, anaphylatoxin prepared with rabbit, horse or dog serum does not seem to be at all toxic for guinea-pigs nor for the rabbit, horse or dog.

Revista Medica del Rosario

October, 1918, **8**, No. 5

104 *Chronic Cervicometritis. E. Argons.—p. 349.
105 Lessons from a Case of "Decomposition." J. C. R. Cuesta.—p. 362.
106 Notes from Tixier's Service at Lyons. J. B. Abalos.—p. 365.
107 The Liga Contra la Tuberculosis. C. Alvarez.—p. 415.

104. **Treatment of Chronic Metritis.**—Argons insists that when there is cervicitis we can count on there being also metritis. The two can be cured, he says, in the simplest and easiest way by cauterizing with Filhos' caustic. This, he says, is a mixture of 2 parts potassium hydroxid and one of lime (*potasa caustica y cal*). The mixture is liquefied and run into the shape of a pencil. With this the lesions are cauterized. They form a soft black eschar, which drops off in eight or ten days not leaving a retractile cicatrix. The pain induced by the cauterization was insignificant in the six or seven cases thus treated. In two of them, described in detail, the metritis was of long standing and surgical

measures seemed the only resource. The caustic of Filhos is one of the old formulas in the textbooks as a paste made of caustic potash and quicklime mixed with alcohol. The French Codex specifies: potassa 100, lime 20; melt the potassa, add the lime and pour into molds.

Revista de Medicina y Cirugia, Havana

Nov. 10, 1918, **23**, No. 21

108 Cocain in Eye, Ear, Nose and Throat Work. A. F. Oñate.—p. 585.

Revista de Medicina y Cirugia Practicas, Madrid

Oct. 28, 1918, **121**, No. 1528

109 *The Law Regulating Septic Accumulations in Otology. F. Rueda. —p. 99. Commenced in No. 1527, p. 65.

109. **The Law of Narrow Passages.**—Rueda says that the middle ear represents a diverticulum of the respiratory apparatus. The eustachian tube grows very narrow as it ascends, and this narrow portion is an important protection against the migration of germs from the mouth to the middle ear. In case of inflammation, the narrow portion becomes congested and may close up entirely for the time being, thus protecting the ear completely. But if the germs manage to get into the ear, the very fact of the narrowness of the passage into the tube prevents ample drainage. The bacterial products accumulate; as they are unable to escape they damage the walls of the cavity, and these walls lose what defensive powers they normally possessed, while the germs in the enclosed space have their virulence enhanced. He shows how the whole middle ear and mastoid apparatus is a succession of narrow passages and broad cavities which all act in the same way to check the spread of infection, but once it has passed the barriers, it acquires unwonted virulence. His diagram of the conditions shows further how the infection can spread along a narrow passage and cause no damage to the walls or have its virulence increased, but when it reaches a cavity where the pus can stagnate, then serious processes develop at this point, and the infection seems to have leaped over the intervening space.

Semana Medica, Buenos Aires

Sept. 26, 1918, **25**, No. 39

110 *Comparative Findings with Different Technics for Tuberculin Test. J. P. Garrahan and L. Iraola.—p. 389.
111 Present Status of Dysmenorrhea. C. A. Castaño.—p. 395.
112 Papaverin. J. R. Goyena.—p. 401.
113 Outline for Study of Auscultation. A. Vitón.—p. 403.
114 *Boiled Milk. A. D'Alessandro.—p. 405.

Oct. 3, 1918, **25**, No. 40

115 Typhoid at Rosario. J. B. Valdés.—p. 413.
116 Operative Correction of Stiff Joints. A. Ceballos.—p. 416.
117 *Sign of Death of Fetus. C. F. Gandolfo.—p. 420.
118 Ileus from Diverticulum. P. O. Bolo and A. G. Gallo.—p. 421.
119 Constipation in Women. C. A. Castaño.—p. 427.

110. **The Tuberculin Test in Children.**—Garrahan and Iraola applied to 350 children the tuberculin skin test, the intradermal and the puncture test, using, respectively, the Pirquet, the Mantoux and the Hamburger technics. The children were from 2 to 13 years old, and all were apparently healthy. More than 1,500 tuberculin tests were made in the course of this research. They compare their findings with those recently reported by Bass. They confirm the greater sensitiveness of the Mantoux intradermal technic (with 0.0001 gm. tuberculin). It was often positive with a negative Pirquet, sometimes even in cases of active tuberculosis. There were no mishaps from the intradermal test; the one case of ulceration followed the skin test. The necessity for repeating the tests is greater the older the child. From 11 to 14 the skin tuberculin test at the first application gave only 55 per cent. of the positive responses obtained on repeating the test. No harm seemed to follow the intradermal or subcutaneous injection of the larger dose, 0.001 gm. tuberculin, when the response before had been negative or dubious.

114. **Boiling of Milk.**—D'Alessandro protests that if we systematically boil milk for children we must boil the butter also.

117. **Sign of Death of Fetus.**—Gandolfo's experience has confirmed the value of Boero's sign of the death of the fetus. When the beat of the aorta can be heard through the uterus between the fourth and seventh months of a pregnancy, the probabilities are that the fetus has been dead for at least ten or fifteen days. The beat of the aorta is not heard with the stethoscope in normal gestation at this period. In his experience, this sign never failed to be a reliable index of the death of the fetus.

Siglo Medico, Madrid

Sept. 21, 1918, **65**, No. 3380

120 *Symptoms from Bladder Stones. A. Pulido Martin.—p. 769.
121 Psychasthenia with Erotic Obsession. A. Sanchez-Herrero.—p. 773.

Sept. 28, 1918, **65**, No. 3381.

122 Early Diagnosis of Appendicitis. L. Cardenal.—p. 789.
123 Significance and Origin of Rieder's Cells. G. Pittaluga.—p. 794.
124 Referendum on Influenza. M. Salazar and others.—p. 796.

120. **Symptoms from Bladder Stones.**—Martin remarks that the first symptom from the presence of a stone in the bladder is increased frequency of micturition after exercise liable to displace the stone in the bladder. Each new contact of the stone with the walls of the bladder acts as a foreign-body stimulus for the bladder to contract. Inquiry will usually elicit this increased frequency of micturition after exercise, although the patient may not have heeded it. The questions must be worded so as not to suggest the answers to the patient. Twelve cases are described; one boy of 12 complained of a sensation as of a foreign body in his bladder, and it hurt him when he ran or jumped. Another boy of 14 had for years had difficulty in urinating. After each micturition he had to remain seated for a time as standing was extremely painful. He was unable to run or ride a horse on account of the pain. Drinking water also induced pains by the resulting distention of the bladder.

Pain with stones in the noninfected bladder seems to grow less with increasing age. Especially in prostatics, the presence of a stone may cause no appreciable disturbances whatever. A boy may obtain relief from the pain with a stone by pulling on the bladder. He may tear a hole in his breeches pocket in order to do this. A transient interruption of the jet of urine is also instructive, but it is not always a sign of interposition of a stone. Simple cystitis may induce it by the spasm from the pain. Hematuria following exercise and disappearing or diminishing with repose is a symptom of capital importance, even when slight and infrequent. It can be rendered manifest by setting the patient at vigorous exercise, comparing the urine before and after. One man of 64 had blood in the urine when he coughed much. Stones in the kidney, ureter and urethra are not so movable as in the bladder, and hence exercise does not affect the pain from them as a rule. Incontinence of urine may also be a sign of a bladder stone. In three cases reported, the incontinence subsided after removal of the stone. In another case the symptoms were contradictory. There was pain at micturition, most pronounced during repose in bed, and there was no pain when the boy of 13 was running. Terminal hematuria had been noted on two occasions, and occasionally interruption of the jet. One man of 75 who had been under treatment for acute gonorrhea had persisting turbid urine, and the cystoscope disclosed two large bladder stones although there had never been previously any symptoms from them. In most of the cases described lithotrity proved all that was necessary, even in the boys of 12 and 14; when this was impossible prompt recovery followed the high incision.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

Aug. 3, 1918, **2**, No. 5

125 *Alternating Heart Rhythm. S. de Boer.—p. 362.
126 *Physicians in Ancient Egypt. J. G. de Lint.—p. 372.
127 *Prophylaxis of Infectious Diseases. H. C. Mees.—p. 380.
128 Influenza. I. Oljenick.—p. 383; R. W. J. Ploem.—p. 385; E. Polak.—p. 388.

Sept. 28, 1918, **2**, No. 13

129 *Cancer Statistics. W. M. de Vries.—p. 1087.
130 *Starch in Fasting Stomach. Wijnhausen and Lubbers.—p. 1096.
131 Malaria with Symptoms of Meningitis. J. van der Torren.—p. 1102.

125. **Alternating Rhythm.**—De Boer gives electrocardiograms of alternating rhythm on the part of the ventricle, especially when the heart was under the influence of digitalis and

antiarin. His tracings throw light also on the origin of ventricle alternans from delay in transmission of the impulse.

126. **The Physicians of Ancient Egypt.**—De Lint describes the tombs of some of the leading physicians of ancient Egypt, who evidently were prominent men in their day. He also quotes from Herodotus to illustrate the high position they held as medical men and priests. The wall pictures of the tomb of Sechemet, dating from the dynasty 2750 to 1625 B. C. show a luxuriant growth of hair, but those of Auta, a physician during the dynasty that reigned 1350-1205 B. C., are completely shaven, and Herodotus says that the physicians had to shave their entire body every three days. De Lint ascribes this to protection against vermin. Even the eyebrows were shaved off, and they were compelled to bathe twice during the day and twice at night. Their diet was regulated to exclude indigestible articles; they were forbidden to eat beans and pork. They were supported by the offerings made to the gods and had no financial cares. The fees paid by patients could be laid aside for their old age. Polygamy was forbidden to the physician priests. De Lint describes some statues of physicians, preserved at Petrograd and at Leiden, which bear inscriptions to the effect that the offerings made to the gods are to be saved for the physicians, and some of the pictures on the walls of the tombs show the physician and his wife seated at the table of offerings.

127. **Prophylaxis of Infectious Diseases.**—At certain times during the war the children of Reims were compelled to wear gas masks to school. Mees says that he saw recently a photograph of a school room there in which all the children were thus wearing gas masks. If this could be enforced against gas bombs, there is no reason, he declares, why children could not be compelled to wear masks to protect them in times of epidemic disease. In the streets it might not be necessary and would be hard to enforce, but in the school room, under the teacher's eye, it would be a comparatively easy matter thus to ensure absolute protection of the children by this means during the school hours. He suggests that a trial might be made in some small town where diphtheria, for example, seems to be endemic and recurs year after year. If the wearing of masks during school hours was followed by the disappearance of diphtheria from the town, we would know what to think of this prophylactic measure. He mentions several towns in the Netherlands peculiarly adapted for this experiment on a large scale. The children from homes where there is already sickness, and the known carriers might be compelled to wear the masks all the time they are away from home.

129. **Cancer at Amsterdam.**—De Vries relates that at the University Institute of Pathology during the last seven years there have been 518 cases of cancer found among 3,700 necropsies, that is, in 14 per cent. of all the cadavers. Of those under the age of 40, cancer was found in only 2 per cent. The youngest was in a man of 21, cancer of the liver; a woman of 22, rectum, and a man of 23, colon. Cancer of the alimentary canal, from mouth to rectum, formed four fifths of the total; the stomach, two fifths. The institute does not get many female cadavers, which explains the small number of uterine cancer cases. In eighty-two cases the cancer had not been diagnosed during life, often because it was masked by the other fatal disease. This proportion of 16 per cent. of unrecognized cases shows that the official records must be usually too low. In ten cases there were two or more cancers, both evidently primary, but in ten other cases the microscopic findings in the two or more tumors were so much alike that only one in each case can be considered as primary. In conclusion, a series of similar statistics from nine other institutions of the kind are tabulated for comparison. Two from Switzerland show thirty-four and twenty-nine cases of cancer of the thyroid in 521 and 1,078 cadavers. In the other countries there were only from one to five thyroid cancers, and only seventeen in all among the eight other series of statistics, from the Netherlands, Germany and Austria. There was a total of 175 cases of cancer of the lungs among the total 5,795 cadavers listed.

130. **Starch Grains in the Fasting Stomach.**—Wijnhausen and Lubbers report the findings in 600 persons whose stomach content was examined in the morning, fasting, after a test supper of two slices of bread and butter, nine hours before, the mouth well rinsed afterward. It always proved possible to aspirate 1 or 2 c.c. of mucus and fluid from the fasting stomach, and in a certain number of cases grains of starch were evident in it. When no grains of starch could be detected with the naked eye, it was sometimes possible to discover some with the microscope. They classify the cases as those with no microscopic starch grains; those with 1 or more widely scattered grains; those with 1 grain in each field; those with several in each field, and those with macroscopic minimum retention.

The tabulated findings in the 600 cases show that only the gastric and duodenal ulcers were represented in the class *e*, up to 20.6, 22.8 and 23.9 per cent. of the ulcer cases being found with macroscopic minimum retention. On the other hand, all the gastric cancer cases and the cases of gastric achylia were exclusively in classes *a* and *b*, 90 per cent. of each showing no grains of starch under the microscope, and 10 per cent., showing only one or more widely scattered grains. In these two classes were found also all the persons free from any symptoms on the part of the stomach. With stomach disturbances from gallstones, with atony of the stomach, with gastroptosis and with hyperacidity and gastric neuroses, the proportions of cases in class *c*, that is, with macroscopic minimum retention, were, respectively, 8.3, 6.7, 4.5 and 2.6 per cent. From 9.1 to 45.7 per cent. of the entire 600 tested, including the healthy, were found in class *b*, that is with a few widely scattered grains of starch. Hence this finding cannot be accepted as pathologic or significant. But they regard it as extremely significant that not less than 86 per cent. of the 59 patients with gastric ulcer showed macroscopic minimum retention, as also a certain proportion of the cases of gastric neuroses. They call attention especially to this, as the macroscopic minimum retention will enable us to discover a tendency to ulceration in dubious cases, and by keeping our eye on the sail, we can steer the course to safety instead of being surprised by a hematemesis in a supposed mere neurosis. The retention with gastric ulcer occurs intermittently, from pylorospasm. This explains the intermittent nature of the retention. Hypersecretion also favors retention of starch grains; the hydrochloric acid checks the digestion of starch by the saliva. With gastric cancer and achylia, this digestion proceeds unhampered, and practically no starch granules are found nine hours later. Niches and crevices in the stomach lining also favor this microscopic retention. Spasm of the pylorus may be induced by reflex action from gallstones or appendicitis, colitis or enteritis, but the percentage is only a fraction of that with gastric or duodenal ulcer. They emphasize in conclusion that the microscopic findings with cancer are of an entirely different mechanism and significance from those of macroscopic retention.

Ugeskrift for Læger, Copenhagen

Nov. 7, 1918, **80**, No. 45

132 *Calcium Chlorid in Intestinal Tuberculosis. Saxtorph.—p. 1763.
133 Influenza. V. Scheel.—p. 1766.
134 Etiology of Multiple Sclerosis. K. H. Krabbe.—p. 1772.

132. **Calcium Chlorid by the Vein in Intestinal Tuberculosis.**—Saxtorph was encouraged to try this treatment by D. Mandl's success with calcium salts in treatment of rebellious diarrhea with intestinal tuberculosis. Even in the severest cases the diarrhea is said to have been effectually arrested. Saxtorph's experience was equally favorable with it in three of the six cases in which he applied this treatment, namely, injection into a vein in the arm of a 5 per cent. solution of calcium chlorid. With this simple measure the patients were freed of all the symptoms of their intestinal tuberculosis for quite a long period. In the three other cases, no effect was apparent but there were advanced pulmonary lesions in all, and the system was evidently too deeply intoxicated and debilitated by a year of fever to respond to any treatment. At the same time, it might be well to give this treatment a trial even in these desperate cases, although naturally the results cannot be relied on as with the stronger patients.

(The Danish terms used are *Klorkalcium* and *Chloretum calcicum.*)